



Asian Smart Cities Research Innovation Network (ASCRIN)

IIT Kanpur

Academic Profiles

7 October 2022

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Abhishek Chaudhary	Position: Assistant Professor, Civil Engineering
Email: abhishekc@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: https://www.iitk.ac.in/new/abhishek-chaudhary	
Short Bio: <p>Dr. Chaudhary is an Assistant Professor at the Indian Institute of Technology (IIT) Kanpur in the Department of Civil Engineering since December 2018. Prior to joining IITK, he held Postdoctoral Researcher and later a Senior Scientist position at Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland. He earned his Ph.D. in Environmental Engineering with a focus on Life Cycle Assessment and Biodiversity conservation from ETH Zurich. Dr. Chaudhary worked at United States Environmental Protection Agency (EPA) from 2009-2012 as Environmental Engineer. He obtained his Master of Science (M.S.) from University of Cincinnati in Ohio, USA and B.Tech. from IIT Roorkee, India.</p> <p>Dr. Chaudhary has won several prestigious research awards from organizations such as Swiss National Science Foundation, European Commission, US EPA, IASA etc. He is the author of over 25 peer-reviewed journal articles and has presented his work in more than 25 international conferences around the globe.</p> <p>Currently, Dr. Chaudhary is a member of the IUCN SSC Phylogenetic Diversity Task Force (PDTF). In the past, he has contributed to EAT-Lancet commission's report on healthy diets as well as to The Nature Conservancy's report on benefits of source water protection. His work on biodiversity within LCA has been recognized by UNEP-SETAC Life Cycle Initiative as best practice. He has previously served as member of technical advisory group to the LEAP initiative of United Nations' FAO.</p>	
Research Interest Keywords: Life Cycle Assessment, Sustainable agriculture, Sustainable diets, Biodiversity conservation, Environmental conservation, Sustainable infrastructure, Sustainable Supply Chain, Sustainable land use, Environmental policy, Ecosystem services	
Summary of Research Interests: <p>His area of research includes sustainable agriculture and diets, biodiversity conservation, life cycle assessment, environmental modeling and sustainable infrastructure. His work focuses on mining, processing and statistically analyzing existing data, applying mathematical models and developing quantitative methods to assess the impact of everyday products, human activities, economic sectors, national consumption and international trade on multiple indicators of sustainability and inform policy.</p>	
Smart City Themes of Interest: Food Security and Agriculture; Energy, Waste and Water	
Related Publications: <p>Chaudhary, A., Krishna, V. (2019). Country-specific sustainable diets using optimization algorithm. <i>Environmental Science & Technology</i>. 53, 7694-7703; Willett, W., Rockstrom, J., Loken, B., Springmann, M., ..., Chaudhary, A. et al. (2019) Our food in the Anthropocene: The EAT-Lancet commission on healthy diets from sustainable food systems. <i>The Lancet</i>. 393, 447-492.; Chaudhary, A., Gustafson, D., & Mathys, A. (2018). Multi-indicator sustainability assessment of global food systems. <i>Nature Communications</i>, 9(1), 848.; Chaudhary, A. & Brooks, T.M. (2017). National Consumption and Global Trade Impacts on Biodiversity. <i>World Development</i>, 121, 178-187.; Chaudhary, A., Carrasco, L.R., Kastner, T. (2017). Linking National Wood Consumption with Global Biodiversity and Ecosystem Service Losses. <i>Science of the Total Environment</i>, 586, 985-994.; Chaudhary, A., & Kastner, T. (2016). Land Use Biodiversity Impacts Embodied in International Food Trade. <i>Global Environmental Change</i>, 38, 195-204.; Chaudhary, A., & Hellweg, S. (2014). Including Indoor Offgassed Emissions in the Life Cycle Inventories of Wood Products. <i>Environmental Science & Technology</i>, 48(24), 14607-14614.; Chaudhary, A., Pfister, S., Hellweg, S. (2016). Spatially Explicit Analysis of Biodiversity Loss Due to Global Agriculture, Pasture and Forest Land Use from a Producer and Consumer Perspective. <i>Environmental Science & Technology</i>, 50, 3928–3936.; Chaudhary, A., Burivalova, Z., Koh, L.P., Hellweg, S. (2016). Impact of Forest Management on Species Richness: Global Meta- Analysis and Economic Trade-Offs. <i>Scientific Reports</i>, 6, 23954.</p>	
Related Grants: <p>Initiation grant, IIT Kanpur, India; 25,00,000 INR (2020-22); National research project grant, Swiss National Science Foundation, Switzerland; 400,000 Swiss Francs (2017-2020); Research grant, Pulse Canada; 80,000 CAN\$ (2016-17); Research grant, The Netherlands Environmental Protection Agency (PBL), The Netherlands; 16,000 Euro (2017); Postdoctoral fellowship, ETH Zurich, Switzerland; 90,000 Swiss Francs (2016-17); Research grant, The Nature Conservancy, USA; 6000US\$ (2016); PhD scholarship, ETH Zurich, Switzerland; 180,000 Swiss Francs (2012-2015); Research grant, United States Environmental Protection Agency, USA; 120,000 US\$ (2010-12); Student contractor award, United States Environmental Protection Agency, USA; 50,000 US\$ (2009-10); Graduate scholarship, University of Cincinnati, USA; 120,000 US\$ (2007-09)</p>	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Akhilesh Mimani	Position: Assistant Professor, Mechanical Engineering Department
Email: amimani@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: https://www.iitk.ac.in/new/akhilesh-mimani	
Short Bio: AKHILESH MIMANI is an Assistant Professor at the Department of Mechanical Engineering, Indian Institute of Technology Kanpur (IITK) India. Akhilesh received his PhD (2012) in Mechanical Engineering from the prestigious Indian Institute of Science, Bangalore specializing in muffler and duct acoustics. He has completed research associate positions at The University of Adelaide (2016), University of New South Wales Sydney (2017) and University of Technology Sydney (2018) before joining IITK. Akhilesh has over 10 years of experience in acoustics/aeroacoustics and noise control engineering, particularly, in the areas of acoustics-based diagnostics such as source localization techniques. His work comprises a unique blend of the use of analytical models, computations and experiments. Akhilesh's work has been published in reputed international journals and conference proceedings, and he has received funding both from the industry and government bodies, in addition to a number of travel grants, see CV at: https://www.iitk.ac.in/new/data/cv/akhilesh-mimani-curriculum_vitae-19.pdf More information regarding publication and active areas of interest can be found at: https://www.springer.com/gp/book/9789811048272#aboutAuthors https://scholar.google.com.au/citations?user=T8Fzx8gAAAAJ&hl=en&oi=ao https://www.researchgate.net/profile/Akhilesh_Mimani2	
Research Interest Keywords: Urban Planning, Sustainable Environments, Remote Surveillance and Security, Big Data Analytics, Machine Learning	
Summary of Research Interests: My research focuses on the development of acoustic-based diagnostics and noise control techniques for diverse engineering applications which include aerospace structures, internal combustion engines, emission-based health-monitoring of structures amongst others. In the Asian Smart City Research and Innovation Network project, I will use my expertise to develop low-cost & robust algorithms for producing real-time noise mapping which will directly assist with sustainable urban development.	
Smart City Themes of Interest: Infrastructure and Technology; Health and Well being; Urban Planning; Governance and Security	
Related Publications: Mimani et al., Mechanical Systems and Signal Processing, (111), 2018; Croaker et al., The Journal of the Acoustical Society of America (143) 2018; Mimani et al., Wave Motion, (70), 2017; Mimani and Munjal, Journal of Computational Acoustics, (24) 2016; Mimani et al., Mechanical Systems and Signal Processing, (72), 2016; Mimani et al., Journal of Sound and Vibration, (342), 2015; Mimani et al., The Journal of the Acoustical Society of America Express Letters (143) 2013; Mimani and Munjal, Wave Motion, (49) 2012; Mimani, Acoustic Analysis of Elliptical Cylindrical Mufflers, Springer Nature, https://www.springer.com/gp/book/9789811048272#aboutBook	
Related Grants: "Resolving airfoil self-noise mechanism using diagnostic acoustic imaging tool" - project approved by Science Education and Research Board, Department of Science and Technology, New Delhi, India, Grant Amount: Rs. 30,00,000 (30 lakhs) Status: To commence in 2020; "Development of Low-Speed Aeroacoustic Research Facility" Initiation grant by Indian Institute of Technology Kanpur. Grant Amount: 25,00,000 (25 lakhs); \$ 330,550 (AUD) Gas Pipeline blowdown: Characteristics of natural gas pipeline blowdown in remote areas, RP3-11A Cheng Lu, Xiong Liu, Ajit Godbole and Guillaume Michal (University of Wollongong), Neil Smith, Akhilesh Mimani and Anthony Zander (The University of Adelaide), Energy Pipelines CRC (EPCRC) Pty. Ltd., Wollongong, NSW (June 2015). Duration: 1.3 years from July 2015 up to November 2016; \$ 292,700 (AUD) Gas Pipeline blowdown: Characteristics of natural gas pipeline blowdown in built-up (populated) areas, RP3-11B Xiong Liu, Cheng Lu, Ajit Godbole and Guillaume Michal (University of Wollongong), Neil Smith, Anthony Zander (The University of Adelaide) Akhilesh Mimani (University of New South Wales) Energy Pipelines CRC Pty. Ltd., Wollongong, NSW (October 2016).; Australian Research Council (ARC) Discovery Project "Resolving the mechanics of turbulent noise production", worked on this project as a Post-Doctoral research associate at School of Mechanical Engineering, The University of Adelaide, SA – 5005, April 2012 up to June 2015. Total ARC funding: 330,000 AUD; Acoustic design of large exhaust mufflers for mining applications, Jointly funded by the New South Wales (NSW) Government and Hushpak Industries, New Castle, NSW. Project duration: 7 months Grant amount: 1,01,000 dollars.	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Amar Nath Roy Chowdhury	Position: Assistant Professor, Civil Engineering
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Link to online profile: https://www.iitk.ac.in/new/amar-nath-roy-chowdhury , https://sites.google.com/view/optimumshells/home	
Short Bio: <p>Dr Roy Chowdhury joined IIT Kanpur in December 2019. Prior to joining at IIT Kanpur he worked as an Assistant Professor in Civil Engineering at IIT Ropar from 2017 May to 2019 Dec. After completing his MTech degree in Civil Engineering from IIT Bombay (2008) he worked as a structural engineer at Meinhardt Singapore pvt ltd for two years then pursued Ph.D. in Civil Engineering specialized in structural engineering at National University of Singapore. While pursuing Ph.D. at NUS and working as a research fellow he studied the mechanics of nano-shells, and worked on theoretical modelling of sandwich laminates. His Ph.D. and post-doctoral works got published in reputed international journals. He cherishes teaching courses like stability of structures, plates and shells, structural analysis and finite element method. While serving at IIT Ropar he developed a few courses notably plates and shells, stability analysis of thin-walled structures, finite element analysis for structural engineers.</p>	
Research Interest Keywords: <p>Computational Failure Analysis of Lightweight and Slender Structures, Stability of Structures, Plate and Shell Structures, Nonlinear Finite Element Analysis.</p>	
Summary of Research Interests: <p>Roy is a thin-walled structures enthusiast and mainly interested in developing and employing computationally efficient nonlinear finite element analysis techniques to study the behaviour of mechanics of thin-walled and slender structures. Shapes of structures and their interaction the environment have been of great interests to him and so he is trying to learn how to improve the structural performance by controlling its shape. He believes that continuous advances in construction-scale additive manufacturing will enable future structural engineers to build form-efficient disaster-resistant structures for affordable infrastructure.</p>	
Smart City Themes of Interest: Infrastructure and Technology	
Related Publications: <p>Fernando, D, Wang, C M, and Roy Chowdhury, A N (2018). Vibration of laminated-beams based on reference-plane formulation: Effect of end supports at different heights of the beam. <i>Engineering Structures</i>. 159, pp 245-251.</p> <p>Wang, C M, L L, Wang, Roy Chowdhury, A N, Yang, J, Kitipornchai, S and Fernando, D (2017). Critical examination of midplane and neutral plane formulations for vibration analysis of functionally graded beams. <i>Engineering Structures</i>. 130, pp. 275-281.</p> <p>Roy Chowdhury, A N, Wang, C M, (2016). Bending, buckling, and vibration of equilateral simply supported or clamped triangular plates with rounded corners. <i>Journal of Engineering Mechanics</i>, 142(10), 04016074.</p> <p>Rathore, M, Roy Chowdhury, A, and Ghosh, S (2011). Approximate methods for estimating hysteretic energy demand on plan-asymmetric buildings. <i>Journal of Earthquake Engineering</i>, 15, pp 99-123.</p> <p>Roy Chowdhury A, Ghosh, S (2010). The inclusion of P-Δ effect in the estimation of hysteretic energy demand based on modal pushover analysis, <i>ISCT Journal of Earthquake Technology</i>, 47, pp 75-86.</p>	
Related Grants:	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Amey Karkare	Position: Associate Professor CSE
Email: karkare@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: https://www.cse.iitk.ac.in/users/karkare/	
<p>Short Bio: Dr Amey Karkare completed his Ph.D. from IIT Bombay in 2009 and his B.Tech. from IIT Kanpur in 1998. His areas of interest include Intelligent Tutoring Systems, Program Analysis, Compiler Optimizations, Functional Programming, and IoT. He has more than 7 years of industrial experience most of which is in the area of Compiler Optimizations. He is an Associate Professor in the Department of CSE at IIT Kanpur. He was the head of Computer Center and Associate Dean for Digital Infrastructure at IIT Kanpur from Dec 2017 - April 2019. He is a Vice Chairman for GATE-JAM 2020 and 2021 for IIT Kanpur zone.</p> <p>Dr. Karkare received prestigious Infosys fellowship during his Ph.D., and P. K. Kelkar Young Research Fellowship at IIT Kanpur. He has been visiting researcher at Microsoft Research, Redmond, and IIT Bombay.</p> <p>Last few years his focus is on improving how introductory programming courses are taught. He has co-taught large online courses on programming that had registration of more than 30,000 students. The software he developed is being used at several premier institutes in India like IIT Kanpur, IIT Bombay, IIT Goa, IISER Bhopal to name a few. Dr Karkare has also received several awards in recognition of his excellence in the use of innovation and technology to improve the quality of undergraduate teaching.</p>	
Research Interest Keywords: Programming Languages; Compiler Optimization; IoT; Program Analysis; Computer Aided Education	
<p>Summary of Research Interests:</p> <ul style="list-style-type: none"> Intelligent Tutoring Systems Heap Analysis for Garbage Collection and Parallelization Debugging and Verifying Functional Programs Automated End-user Programming Automated Repair and Grading of Programming Assignments Code Similarity Detection 	
Smart City Themes of Interest: Infrastructure and Technology; Security and Safety	
Related Publications:	
Related Grants:	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Anindita Chakrabarti	Position: Associate Professor of Sociology
Email: aninditac@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: https://www.iitk.ac.in/new/anindita-chakrabarti	
Short Bio: Anindita Chakrabarti is an Associate Professor of sociology at the Department of Humanities and Social Sciences, IIT Kanpur. Her research and teaching interests lie in the fields of sociology of religion, sociology of law (with a focus on personal law), economic sociology and urban sociology. She has received her doctoral degree from the Department of Sociology, Delhi University. She has been a visiting scholar at the University of California, Berkeley and a visiting fellow at Leipzig University, CSSS (JNU), and at the Department of Sociology, Delhi University. In 2010 she won the Professor M. N. Srinivas Memorial Prize, awarded by the Indian Sociological Society for her paper titled "Judicious Succession and Judicial Religion: Internal Conflict and Legal Dispute in a Religious Reform Movement in India". Her monograph titled <i>Faith and Social Movements: Religious Reform in Contemporary India</i> was published by the Cambridge University Press in 2018. Her co-edited volume titled <i>Religion and Secularities: Reconfigurations of Islam in Contemporary India</i> will be published in 2020 by Orient Blackswan. She has been a Senior Fellow at the Humanities Centre for Advanced Studies (HCAS) at Leipzig University (2016-20).	
Research Interest Keywords: Sociology of law; urban sociology; informal economy and skill development	
Summary of Research Interests: Urban planning, occupation, health and marginalization. I have been conducting ethnographic research in the urban informal gold jewelry manufacturing sector since 2016. The study addresses issues of internal migration, skill transfer and manufacturing clusters in India.	
Smart City Themes of Interest: Urban Planning; Governance and Security; Cultural Heritage	
Related Publications: <ol style="list-style-type: none"> 1. Anindita Chakrabarti and Suchandra Ghosh. "Judicial Reform vs Adjudication of Personal Law: View from a Muslim Ghetto in Kanpur," Economic and Political Weekly, Vol. 52, No. 2, Dec 2017. 2. Anindita Chakrabarti. "Democracy as Civil Religion: Reading Alexis De Tocqueville in India" in Journal of Human Values (Sage Publication), Vol. 22 (1) January 2016. 3. Suchandra Ghosh and Anindita Chakrabarti. "Religion-based 'Personal' Law, Legal Pluralism and Secularity: A Field View of Adjudication of Muslim Personal Law in India" Working Paper Series 16 of the HCAS Multiple Secularities – Beyond the West, Beyond Modernities. Leipzig University, 2019. 4. Sruti Kanungo and Anindita Chakrabarti. 'A Sociological Study of Work, Mobility and Enterprise among the Goldsmiths of India: A Multi-Sited Ethnography', in Methodological Issues in Social Entrepreneurship Knowledge and Practice edited by Satyajit Majumdar and Edakkandi Meethal Reji. Singapore: Springer). 2020. 5. Sruti Kanungo and Anindita Chakrabarti. "Gold Governance, Gold Manufacturing and the New Goldsmiths' Guilds in Contemporary India: An Economic Sociology of Skill and Informality" (Revised and resubmitted to <i>Contributions to Indian Sociology</i>). 	
Related Grants: Principal Investigator. A Sociological Study of Goldsmiths of Bengal: Artisanal Entrepreneurship, Skill Development, and Technology. Sponsored by the India Gold Policy Centre, Indian Institute Management Ahmedabad, 2018-2020.	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Ankush Sharma	Position: Associate Professor, Electrical Engineering
Email: ansharma@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: www.ankushsharma.com	
Short Bio: Dr Ankush Sharma is currently working as associate professor in the department of electrical engineering at Indian Institute of Technology (IIT) Kanpur, India. Prior to that, he was working as Assistant Professor at IIT Bhubaneswar, India. In addition to academic experience of around 4 years, he also has close to 16 years of software industry experience, worked in Tata Consultancy Services and Wipro Limited, primarily in the Power system and smart grid domains. He holds Ph.D. and M. Tech. degrees in Electrical Engineering from IIT Kanpur. He has been Project Management professional (PMP®) certified in 2009 from Project Management Institute (PMI), USA and holds MBA degree in Finance. He has executed various research and consultancy projects as PI and Co-PI. He is a senior member of IEEE.	
Research Interest Keywords: Smart Grid Technology; Synchrophasor Measurement; Internet of Things; Big Data; Smart Cities; Machine Learning; State Estimation; Energy Storage; Microgrid; Wide Area Monitoring Systems	
Summary of Research Interests: With the advent of smart grid and the synchrophasor technology, the power system area is transforming into advanced Information and Communication Technology (ICT) enabled architecture. The smart grid enabled modern power system area needs good knowledge of the Information Technology (IT) and Communication Technology (CT). Therefore, my research interest includes new technologies such as Intelligent Electronics Devices (IEDs), Phasor Measurement Units (PMUs), and Internet of Things (IoT).	
Smart City Themes of Interest: Infrastructure and Technology; Mobility and Transport; Security and Safety; Energy, Waste and Water	
Related Publications: <ol style="list-style-type: none"> 1. Kapoor and A. Sharma, "Optimal Charge/Discharge Scheduling of Battery Storage Interconnected With Residential PV System," IEEE Systems Journal, vol., no., pp. 1-10, Early Access 2. Dubey, S. Chakrabarti, A. Sharma and V. Terzija, "Optimal utilisation of PMU measurements in power system hybrid state estimators," in IET Generation, Transmission & Distribution, vol. 13, no. 21, pp. 4978-4986, Nov. 2019 3. Shalini, S. R. Samantaray and A. Sharma, "Enhancing Performance of Wide-Area Back-Up Protection Scheme Using PMU Assisted Dynamic State Estimator," in IEEE Transactions on Smart Grid, vol. 10, no. 5, pp. 5066-5074, Sept. 2019 4. S. J. Geetha, A. Sharma and S. Chakrabarti, "Unscented Rauch–Tung–Streibel smoother-based power system forecasting-aided state estimator using hybrid measurements," in IET Generation, Transmission & Distribution, vol. 13, no. 16, pp. 3583-3590, Aug 2019 5. Shalini, S. R. Samantaray and A. Sharma, "Supervising zone-3 operation of the distance relay using synchronised phasor measurements," in IET Generation, Transmission & Distribution, vol. 13, no. 8, pp. 1238-1246, Apr. 2019 6. Sharma and S. R. Samantaray, "Power System Tracking State Estimator for Smart Grid Under Unreliable PMU Data Communication Network," IEEE Sensors Journal, vol. 18, no. 5, pp. 2107-2116, March 2018 7. Sharma, S. C. Srivastava, and S. Chakrabarti, "An Extension of Common Information Model for Power System Multi Area State Estimation", IEEE Systems Journal, vol. 11, no. 3, pp. 1692-1701, Sept. 2017 8. Sharma, S. C. Srivastava, and S. Chakrabarti, "A Cubature Kalman Filter Based Power System Dynamic State Estimator", IEEE Transactions on Instrumentation and Measurement, vol. 66, no. 8, pp. 2036-2045, Aug. 2017 9. Sharma, S. C. Srivastava, and S. Chakrabarti, "Testing and validation of Power System Dynamic State Estimators Using Real Time Digital Simulator (RTDS)", IEEE Trans. Power Syst., vol. 31, no. 3, pp. 2338-2347, May 2016 10. Sharma, S. C. Srivastava, and S. Chakrabarti, "A Multi-Agent Based Power System Hybrid Dynamic State Estimator for Smart Grid", IEEE Intelligent Systems, vol. 30, no. 3, pp. 52-59, May-June 2015 	
Related Grants: <ol style="list-style-type: none"> 1. Internet of Things for Smart Grid: Selected applications on visualization, monitoring, and Control of power system network. Funding agency: IIT Kanpur. Project duration: Nov. 2018 to Oct. 2020. Role: PI. 2. Development of R&D platform for smart city projects in the Indian context. Funding agency: the Ministry of Power (MoP), India and IIT Kanpur. Project duration: Dec. 2014 to June. 2021. Role: Co-PI. 3. UI-ASSIST (US-India collAborative for smart diStribution System wltH STORage). Funding agency: Indo-U.S. Science and Technology Forum (IUSSTF) & DST, India and DOE, USA. Project duration: Sep. 2017 to Aug. 2022. Role: Co-PI. 4. Development Of PMU-Based IT-OT Applications For Line Fault Location For Cesc Ltd. Kolkata. Funding agency: CESC Kolkata. Project duration: July. 2019 to July. 2020. Role: Co-PI. 5. Technical Support In Implementation Of SCADA/ADMS/GIS In The Area Of KESCO, Kanpur. Funding agency: KESCO Kanpur. May. 2019 to May. 2022. Role: Co-PI 	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Anubha Goel	Position: Associate Professor, Department of Civil Eng.
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Link to online profile: https://scholar.google.com/citations?user=il6-xT0AAAAJ&hl=en&oi=ao	
Short Bio: Dr. Anubha Goel is an Associate Professor in the Dept of Civil Eng. (Environmental group) at IIT Kanpur where she has been a faculty member since 2010 post 2 years of environmental consulting experience in USA. She is also a contributing faculty in the Centre for Environmental Science and Eng. IIT Kanpur. Her research, focused on environmental quality management for sustainable built environment, involves both on field and in laboratory studies. Her knowledge sharing as a resource personnel and a panellist in national/international level committees has been well recognized. She received leadership award (Indoor Environment Lead Award) at the ACIEQ 2019. During her doctoral research at the University of Maryland College Park, USA she handled a USDA project and examined spatial and temporal variations in occurrence and behaviour of pesticides in the atmosphere. This was after her M. Tech at IIT Kanpur where she was awarded the DAAD scholarship for research work in Germany. Dr. Goel is quite involved in outreach and public awareness activities and is one of the founding faculty members of CDAP (Centre for Differently Abled Persons) at IIT Kanpur.	
Research Interest Keywords: environmental quality management, noise, particles, waste management, exposure levels, health risk quantification, interventions and mitigation, combustion source characterization, low cost sensors, public awareness, smart transport	
Summary of Research Interests: <ul style="list-style-type: none"> • Characterizing emissions from indoor combustion sources and vehicular exhaust • Quantification of exposure to air pollutants, like fine particles, and calculation of health risk to different demographic profiles - noise mapping - hotspot identification • Examine use of Interventions/ develop techniques to mitigate exposure levels and maintain indoor environmental quality • Productive utilization of solid waste • Achievement of Sustainable mobility through Implementation of inclusive strategies 	
Smart City Themes of Interest: Mobility and Transport; Health and Well being; Urban Planning; Energy, Waste and Water	
Related Publications: Characteristics of exposure to particles due to incense burning inside temples in Kanpur, India A Goel, R Wathore, T Chakraborty, M Agrawal Aerosol Air Qual. Res 17, 608-615; Goel, A., Mundra, R., Ola, D. "Examination of Particle Characteristics and Quantification of Emission Factors for Smoke Generated from a Popular Indian Incense Burnt in an Experimental Chamber". Indoor Environmental Quality, Sharma, A., Goyal, R., Mittal, R. (Editors), Springer (In-press).; Jain, S., Garg, D., Goel, A. " Comparison of Indoor Air Quality for Air-Conditioned and Naturally Ventilated Office Spaces in Urban Area". Indoor Environmental Quality, Sharma, A., Goyal, R., Mittal, R. (Editors), Springer (In-press).; Goel, A. Izhar, S. Gupta, T. (2017) .Study of Environmental particle levels, its effect on lung deposition and relationship with human behavior. Gupta, T. et al. (Eds.) Environmental Contaminants: Measurement, Modeling and Control (pp 77-92). Springer Series: Energy, Environment and Sustainability. Singapore: Springer Nature Pte. Ltd.; Burden of disease for workers attributable to exposure through inhalation of PPAHs in RSPM from cooking fumes A Goel, D Ola, AV Veetil Environmental Science and Pollution Research 26 (9), 8885-8894; Toxicity potential of particles caused by particle-bound polycyclic aromatic hydrocarbons (PPAHs) at two roadside locations and relationship with traffic A Goel, S Rathi, M Agrawal Environmental Science and Pollution Research 25 (30), 30633-30646; Compositional and surface characterization of HULIS by UV-Vis, FTIR, NMR and XPS: Wintertime study in Northern India V Kumar, A Goel, P Rajput Atmospheric Environment 164, 468-475; Investigation of levels in ambient air near sources of Polychlorinated Biphenyls (PCBs) in Kanpur, India, and risk assessment due to inhalation A Goel, K Upadhyay, M Chakraborty Environmental monitoring and assessment 188 (5), 278;	
Related Grants: "Analysis of Size-Segregated Composition and distribution of organic compound on ambient air particle- Season variation in urban environment in northern India" SERB-DST FastTrack; National Carbonaceous Aerosols Programme (NCAP)- 9,32,049,50 INR For WGIII:Modeling carbonaceous aerosol source influence and atmospheric effects (Associate Institution) MOEFCC (As Co-PI); Under Review - Identification of Hotspots through Noise Mapping of City and Measures for Noise Abatement	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Arghya Das	Position: Assistant Professor, Civil Engineering
Email: arghya@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: https://www.iitk.ac.in/new/arghya-das	
Short Bio: Post-Doctoral Researcher in Northwestern University, Department of Civil & Environmental Engineering – 2013-14 Ph.D. from The University of Sydney 2009-13 M.Tech. from Indian Institute of Technology Bombay in 2007-09 BE from Jadavpur University, 2002-2006 Publication: Peer reviewed journal #21 (e.g., Journal of Engineering Mechanics, JMPS, Powder Technology, Rock Mechanics and Mining Sciences, JGR Solid Earth, Geotechnique, Journal of Structural Geology, Numerical and Analytical Methods in Geomechanics, Geotextile and Geomembrane, Acta Geotechnica) Peer reviewed conference #20. Thesis supervision: M.Tech. Thesis #11; PhD Thesis submitted #1 and ongoing #5 Teaching: Instructor of various civil and geotechnical engineering courses both at the UG and PG level.	
Research Interest Keywords: Constitutive modelling of geomaterials; Micromechanics of granular materials; Flow through porous media; Bifurcation & instability analysis in geomaterials; Damage and fracture mechanics;	
Summary of Research Interests: Over the last six years our research group is focusing on micromechanics of granular and cemented granular geomaterials, e.g., sand, rock, concrete. We try to understand how various alteration of micro-structure in terms of collapse, crushing, damage and even chemical degradation affects the overall response of those materials. Finally, our objective is to develop theoretical models and codes that mimic the response of geomaterials due microstructural variations. These studies are important in various filed, namely civil infrastructure, reservoir mechanics, oil-gas industries, & waste disposal.	
Smart City Themes of Interest: Infrastructure and Technology; Energy, Water and Waste	
Related Publications: <ol style="list-style-type: none"> 1. Lal, D. K., & Das, A. (2020). Development of semi-implicit midpoint and Romberg stress integration algorithms for single hardening soil constitutive models. Engineering Computations. (Article in Press). 2. Nanda, K., Vaishakh, T. K., Das, A., & Misra, S. (2020). Hydro-mechanical response in porous rocks during localized deformation: finite element analysis. Journal of Structural Geology, 130, 103909. 3. Das, A. & Kumar, A. (2017). Evolution of pore size distribution in deforming granular materials. Géotechnique Lett. 7, No. 1, 1–6. 4. Nguyen, C.T., Nguyen, G.D., Das, A. & Bui, H.H. (2017). Constitutive modelling of progressive localised failure in porous sandstones under shearing at high confining pressures. Int. J. Rock Mech. Min. Sci. 93, 179–195. 5. Das, A., & Buscarnera, G. (2014). "Simulation of localized compaction in high-porosity calcarenite subjected to boundary constraints." International Journal of Rock Mechanics and Mining Sciences, 71, 91–104. 6. Das, A., Tengattini, A., Nguyen, G. D., Viggiani, G., Hall, S. a., & Einav, I. (2014). "A thermomechanical constitutive model for cemented granular materials with quantifiable internal variables. Part II - Validation and localization analysis." Journal of the Mechanics and Physics of Solids, 70, 382–405. 7. Das, A., Nguyen, G. D., and Einav, I. (2013). "The propagation of compaction bands in porous rocks based on breakage mechanics." Journal of Geophysical Research, DOI: 10.1002/jgrb.50193. 	
Related Grants: IITK – Initiation grant, Development of A Mutli-Scale Constitutive Model for Granular Materials Subjected to Coupled Chemo-Mechanical Loading, 2014-2017, 25.0, PI SERB – Early career research award, Permeability Evolution in Deep-Reseroir Rocks an Experimental and Numerical Study, 2016-2019, 40.77, PI CSIR – Extra mural research, An Experimental and Numerical Assessment of Indian Crushable Sands Under Cyclic Loading, 2017 - 2020, 18.43, PI ONGC – Pan IIT program, Micro-Poro-Mechanical Modelling of Shale Anisotropy and Permeability, 2018-2020, 48.04, Co-PI (PI – Prof. S. Basu)	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Arvind Kumar	Position: Associate Professor, Mechanical Engineering
Email: arvindkr@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: http://home.iitk.ac.in/~arvindkr/	
Short Bio: Dr Arvind Kumar is an Associate Professor in the Department of Mechanical Engineering at IIT Kanpur since 2012. Dr. Kumar received his bachelor's degree (2001) in Manufacturing Engineering from NIFFT, Ranchi, master's degree (2003) and Ph.D. (2008) from IISc Bangalore. After graduation, he worked as a postdoctoral fellow at the Ecole des Mines de Nancy, France. He has worked in France for about three years before moving to the UK as a Marie Curie Fellow at the University of Southampton.	
Research Interest Keywords: Thermal energy storage, 3D printing	
Summary of Research Interests: We work in the areas of PCM based thermal energy storage technologies, ice slurry based cold thermal storage, and utilization of 3D printing technologies in thermal performance enhancement. The applications are in solar-thermal energy, waste heat, refrigeration and cooling.	
Smart City Themes of Interest: Energy, Waste and Water	
Related Publications: <ol style="list-style-type: none"> 1. V. Soni, A. Kumar, V. K. Jain, Modelling of PCM melting: Analysis of discrepancy between numerical and experimental results and energy storage performance, <i>Energy</i>, 150, 2018, pp. 190-204. 2. V. Soni, A. Kumar, V.K. Jain, Performance evaluation of nano-enhanced phase change materials during discharge stage in waste heat recovery, <i>Renewable Energy</i>, 127, 2018, pp. 587-601. 3. S.K. Yadav, D. Ziyad, A. Kumar, Numerical investigation of isothermal and non-isothermal ice slurry flow in horizontal elliptical pipes, <i>International Journal of Refrigeration</i>, 97, 2019, pp. 196-210. 4. V. Soni, A. Kumar, V.K. Jain, A novel solidification model considering undercooling effect for metal based low temperature latent thermal energy management, <i>Journal of Energy Storage</i>, 21, 2019, pp. 528-542. 5. Kumar, S.K. Yadav, A. Mahato, A. Kumar, On-demand intermittent ice slurry generation for subzero cold thermal energy storage: Numerical simulation and performance analysis, <i>Applied Thermal Engineering</i>, 161, 2019, 114081. 6. V. Tiwari, A. Kumar, A. Kumar, Enhancing ice slurry generation by using inclined cavity for subzero cold thermal energy storage: Simulation, experiment and performance analysis, <i>Energy</i>, 183, 2019, 398-414. 7. V. Soni, A. Kumar, V.K. Jain, Fast waste heat recovery in 100–150°C using close-contact charging of nano-enhanced PCM composite, <i>Journal of Molecular Liquids</i>, 285, 2019, 347-361. 8. S.S. Reddy, V. Soni, A. Kumar, Diurnal thermal performance characterization of a solar air heater at local and global scales integrated with thermal battery, <i>Energy</i>, 177, 2019, 144-157. 9. V. Soni, A. Kumar, A. Kumar, V.K. Jain, Real-time experimental study and numerical simulation of phase change material during the discharge stage: Thermo-fluidic behavior, solidification morphology and energy content, <i>Energy Storage</i>, 1(1), e51, 2019. 	
Related Grants: Innovative thermal energy storage systems (INOTES), EU-Indo project (funded by DST, India), 70L, 2014-17. Computational studies on phase change transport phenomena in ice slurry, funded by SERB, India, 18L, 2014-17.	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Ashish Garg	Position: Professor, Materials Science and Engineering
Email: ashishg@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: http://home.iitk.ac.in/~ashishg	
Short Bio: Ashish Garg is Professor at the Department of Materials Science and Engineering at Indian Institute of Technology (IIT) Kanpur. He obtained his undergraduate and master's degrees in Metallurgical Engineering from India and PhD in Materials Science and Metallurgy from University of Cambridge, followed by an independent Research Fellowship at Downing College, Cambridge before joining IIT Kanpur in 2003. His current research focusses on exploring and developing materials related to energy conversion and energy harvesting e.g. solar photovoltaics and multiferroics and their device integration as well as magnetoelectric and multiferroic materials and their devices. He has taught a variety of courses and some of his courses are available online, prepared under National Programme on Technology Enhanced Learning (NPTEL) of Government of India. He has won national and international awards including Australia-India Science and Technology award as well as Endeavour Fellowship.	
Research Interest Keywords: Solar Photovoltaics, Materials, Energy harvesting	
Summary of Research Interests: I work on Solar Photovoltaic materials and device development, energy materials development, energy harvesting using piezoelectrics, magnetoelectrics and triboelectrics and their devices, materials development for electronic devices.	
Smart City Themes of Interest: Infrastructure and Technology; Mobility and Transport; Energy, Waste and Water	
Related Publications: Please see the website	
Related Grants:	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Ashoke De	Position: Associate Professor, Aerospace Engineering
Email: ashoke@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: home.iitk.ac.in/~ashoke	
Short Bio: Dr Ashoke De is currently working as Associate Professor in the Department of Aerospace Engineering at Indian Institute of Technology Kanpur. Dr De received his Masters' degree in Aerospace Engineering from IIT Kanpur in 2004, and PhD degree in Mechanical Engineering from Louisiana State University, USA in 2009. Before joining IIT Kanpur, he has worked as post-doctoral scholar at Technical University of Delft (TU-Delft), Netherlands and as Research Engineer in GE Global research at Bangalore. He is the recipient of Humboldt Research fellowship for experienced researcher (2018), DAAD Fellowship (2016), IEI-Young Engineer's Award-2014 (Aerospace Engineering), Early Career Research award-2015 (DST, India), Expertise Award-2010 (GE Global research), and P K Kelkar Research Fellowship (for outstanding young researcher 2015-2018) from IIT Kanpur. He is a member of ASME, AIAA, APS, SIAM, FMFP, ISHMT and Combustion Institute. Dr De leads large scale initiatives in the modeling of turbulent reacting and non-reacting flows at IIT Kanpur. So far, he has authored more than 130 peer reviewed articles in journals and conferences. He is actively pursuing research projects from various organizations like ISRO, ARDB, DST and PWC.	
Research Interest Keywords: CFD, FSI, Energy harvesting, Combustion, Turbulent flow.	
Summary of Research Interests: Dr De leads large scale initiatives in the modeling of turbulent reacting and non-reacting flows at IIT Kanpur. His current research interests include energy harvesting and storage, combustion modeling, flow control, high-speed flows, and Fluid-Structure interactions (FSI). His primary research focus is the emerging field of computational mechanics with particular interest in reacting and non-reacting flows.	
Smart City Themes of Interest: Energy, Waste and Water; Mobility and Transport	
Related Publications: Pls refer to the website (https://home.iitk.ac.in/~ashoke/publications.php)	
Related Grants: <ul style="list-style-type: none"> PI, "Development of impurity transport code for Aditya -U tokamak at IPR Gandhinagar", Board of Research in Nuclear Sciences (BRNS), India; 2019-2021 PI, "Development and Assessment of Hybrid RANS/LES models for predicting flow physics in an airfoil with leading edge tubercles", Aeronautical Research and Development Board, India; 2019-2021 PI, "CFD-CAA simulation of flow-acoustic coupling in a half-dump combustor", Science and Engineering Research Board, Department of Science and Technology, India; 2017-2019 Co-PI, "Numerical Investigation of Lox-CH₄ combustion", Indian Space Research Organization-IITK Space Technology Cell; 2018-2020 PI, "Stochastic Probability Density Function (PDF) based combustion modelling using Flamelet Generated Manifold (FGM) tabulated chemistry for jet-in-hot coflow flames", Science and Engineering Research Board, Department of Science and Technology, India; 2016-2018 PI, "Numerical Investigation of Soot Formation in Turbulent Diffusion Flames", Aeronautical Research and Development Board, India; 2015-2017 Co-PI, "Passive and active control of hooting", Pratt & Whitney, Canada; 2012-2015 PI, "Large Eddy Simulation (LES) study of Delft-Jet-in-Hot-Coflow burner using Eddy Dissipation Concept model for Turbulence-Chemistry Interaction", Indian Institute of Technology- Start-up Grant; 2011-2013 	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Avinash Kumar Agarwal	Position: Professor, Mechanical Engineering
Email: akag@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: www.iitk.ac.in/erl	
Short Bio: Prof. Avinash Kumar Agarwal obtained his B.E. (Mech Engg., 1994) from Malviya Regional Engineering College, Jaipur and M.Tech. (Energy, 1996) and Ph.D. (Energy, 1999) from Indian Institute of Technology Delhi. After his Post-Doctoral Fellowship (1999 – 2001) stint at the Engine Research Center, University of Wisconsin, Madison, USA, he returned to India in 2001 and joined Department of Mechanical Engineering, Indian Institute of Technology Kanpur, where he is now serving as SBI Endowed Chair Professor. He was a Visiting Professor to University of Loughborough, UK, Photonics Institute, University of Vienna, Austria, Hanyang University, South Korea and Korea Advanced Institute of Science and Technology, South Korea. For his outstanding contributions, Prof. Agarwal is conferred upon J C Bose National Fellowship (2019) by SERB, Clarivate Analytics India Citation Award-2017 in Engineering and Technology, Prestigious Shanti Swarup Bhatnagar Prize (2016) in Engineering Sciences, Rajib Goyal Prize in Physical Sciences (2015); NASI-Reliance Industries Platinum Jubilee Award (2012); INAE Silver Jubilee Young Engineer Award (2012); Dr. C. V. Raman Young Teachers Award (2011); SAE International's Ralph R. Teetor Educational Award (2008); INSA Young Scientist Award (2007); UICT Young Scientist Award (2007); INAE Young Engineer Award (2005); Devendra Shukla Research Fellowship (2009-12), Poonam and Prabhu Goyal Chair Professorship (2013-16), SBI Endowed Chair Professorship (2018-21).	
Research Interest Keywords: Internal Combustion Engine, HCCI, Biofuels: Biodiesel, Methanol/ DME, Gaseous fuels: CNG, hydrogen, Hythane, Laser diagnostic techniques, Laser ignition of combustible mixtures, Lubricating oil tribology, Micro-sensors, Emissions: Regulated, Unregulated, Particulates, Secondary aerosols, Emission Toxicology, After-treatment technologies	
Summary of Research Interests: At IIT Kanpur, Prof. Agarwal worked in the areas of IC engines, combustion, conventional fuels, alternative fuels, methanol fuelled engine development, hydrogen, fuel sprays, lubricating oil tribology, optical diagnostics, laser ignition, HCCI, particulate and emission control, and large bore engines. He has developed laser fired hydrogen and CNG engines in automotive sizes and developed the first electronic fuel injection system equipped locomotive engine for Indian Railways.	
Smart City Themes of Interest: Mobility and Transport; Energy, Waste and Water	
Related Publications: 6. Avinash Kumar Agarwal*, Nikhil Sharma, Akhilendra Pratap Singh, Vikram Kumar, Dev Prakash Satsangi, Chetankumar Patel, "Adaptation of Methanol–Dodecanol–Diesel Blend in Diesel Genset Engine", ASME Journal of Energy Resources Technology, October 2019, V; 7. Felix Sebastian Hirner, Joonsik Hwang, Choongsik Bae*, Chetankumar Patel, Tarun Gupta, Avinash Kumar Agarwal, "Performance and emission evaluation of a small-bore biodiesel compression-ignition engine", Energy, Vol. 183, pp 971-982, September 2019. (Impact Factor2017: 5.537; DOI: https://doi.org/10.1016/j.energy.2019.07.015 ; ISSN # 0360-5442).; 8. Joonsik Hwang, Felix Sebastian Hirner, Choongsik Bae*, Chetankumar Patel, Tarun Gupta, Avinash Kumar Agarwal, "HRTEM evaluation of primary soot particles originated in a small-bore biofuel compression-ignition engine", Applied Thermal Engineering, Vol.; 9. Nikhil Sharma, Chetankumar Patel, Nachiketa Tiwari, Avinash Kumar Agarwal*, "Experimental investigations of noise and vibration characteristics of gasoline-methanol blend fuelled gasoline direct injection engine and their relationship with combustion characteristics", Applied Thermal Engineering, Vol. 158, pp113754, July 2019. (Impact Factor2017: 4.58; DOI: https://doi.org/10.1016/j.applthermaleng.2019.113754 ; ISSN # 1359-4311).; 10. Avinash Kumar Agarwal*, Yeshudas Jiotode, Nikhil Sharma, "Endoscopic visualization of engine combustion chamber using diesoline, diesosene and mineral diesel for comparative spatial soot and temperature distributions" FUEL, Volume 241, April 2019, pp; 12. Nikhil Sharma, Rashmi A Agarwal, Avinash Kumar Agarwal*, "Particulate Bound Trace Metals and Soot Morphology of Gasohol Fueled Gasoline Direct Injection Engine" ASME Journal of Energy Resources Technology, February 2019, Vol. 141(2), pp. 022201-022201; 20. Avinash Kumar Agarwal*, Akhilendra P. Singh, Tarun Gupta, Rashmi A. Agarwal, Nikhil Sharma, Prashant Rajput, Swaroop K. Pandey, Bushra Ateeq, "Mutagenicity and Cytotoxicity of Particulate Matter Emitted from Biodiesel-Fueled Engines" Environmental Sci; 21. Avinash Kumar Agarwal*, Akhilendra Pratap Singh, Rakesh Kumar Maurya, Pravesh Chandra Shukla, Atul Dhar, Dhananjay Kumar Srivastava, "Combustion characteristics of a common rail direct injection engine using different fuel injection strategies", Inter; 22. SMV Sagar, Avinash Kumar Agarwal*, "Knocking behavior and emission characteristics of a port fuel injected hydrogen enriched compressed natural gas fueled spark ignition engine", Applied Thermal Engineering, Volume 141, Pages 42-50, August 2018. (Impa	
Related Grants: 1. Design & Retrofitment For Development Methanol Fuelled Large Bore Engine (EMD 710: 4500hp) For Locomotive Marine & Power Generation Application, (Co-PI: Dr. Tarun Gupta, IITK), Department Of Science And Technology, New Delhi, Two Year (Dec. 2017- Dec. 19), Rs. 372.35 Lakhs.;	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

2. Investigation of Combustion and Soot Process in a Compression Ignition Engine Fueled with Biodiesel, Joint Programme of Cooperation in Science And Technology, (India- South Korea), (PI: Dr. Tarun Gupta, IITK), Department Of Science And Technology, New;
3. Experimental Investigations of HCCI/ PCCI Combustion in a Single Cylinder Research Engine Using Biodiesel, (Co-PI: Dr. Tarun Gupta, IITK), Department Of Science And Technology, New Delhi, Three Years, 2013-16, Rs 157.48 Lakhs.;
4. Experimental Investigations on Combustion Characteristics and Emission Reductions of a Laser Fired Hydrogen Engine, (Co-PI: Dr. Abhijit Kushari, IITK), Ministry of New and Renewable Energy (MNRE), New Delhi, Four Years 2012-2016, Rs. 115.44 Lakhs.;
5. Development of A Common Rail Injection System For A Constant Speed Compression Ignition Engine, (Co-PI: Dr. Tarun Gupta, IITK), Council for Scientific and Industrial research (CSIR), New Delhi, Two Years, 2012-15, Rs.14.68 Lakhs.;
6. Laser Ignition of Natural Gas Fuelled Single Cylinder Engine, (Co-PI: Dr. Tarun Gupta, IITK), Science and Engineering Research Board, Department Of Science And Technology, New Delhi, Two Years, 2012-14, Rs 38.00 Lakhs.;
7. Experimental Investigations of Fuel Sprays of Biodiesel, Straight Vegetable Oils and Their Blends with Mineral Diesel for Optimizing Fuel Injection Equipment to Lower Engine Exhaust Emissions, Joint Programme of Cooperation in Science And Technology;
8. Fuel Spray and Combustion Visualization Using Endoscope in Biodiesel Fuelled Direct Injection Engine for Optimal Fuel Injection Strategy and Emission Reduction, (Co-PI: Dr. Ashish Dutta, IITK), Department Of Science And Technology, New Delhi, Two Years;
9. Physico-Chemical Characterization of Nano-Particle Emanating from Diesel Engines (Mineral Diesel and B20 Fuelled) and Their Control Using Diesel Oxidation Catalysts, (PI: Dr. Tarun Gupta, IITK), Science and Engineering Research Board, Department Of Sci;
10. Combustion, Material Compatibility and Engine Tribology Investigation in a Biodiesel Fuelled Turbo-charged Transportation Engine, (Co-PI: Dr. Tarun Gupta, IITK), Department Of Science And Technology, New Delhi, Three Years (2010-2013), Rs. 64.86 Lakhs.

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Balaji Devaraju	Position: Assistant Professor Department of Civil Engineering
Email: dbalaji@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: https://home.iitk.ac.in/~dbalaji	
Short Bio: Balaji Devaraju is an Assistant Professor in the Department of Civil Engineering at Indian Institute of Technology Kanpur (IITK) since September 2018. He received his Bachelor's (Anna University, India) in Geoinformatics Engineering and went on to obtain his Master's (University of Calgary, Canada) and PhD (University of Stuttgart, Germany) degrees specializing in Geodesy. He has held research positions in University of Calgary, Canada; University of Stuttgart, Germany; Leibniz University of Hannover, Germany prior to his appointment at IITK. Dr Devaraju has pioneering contributions in the field of signal processing on the sphere, where he developed methods and tools for design and analysis of filters. He was <i>magna cum laude</i> for his PhD dissertation. He received a scholarship for pursuing his Master's studies. He is a member of the International Association of Geodesy, European Geosciences Union and the American Geophysical Union. Currently, Dr Devaraju is chairing a joint working group on <i>Understanding the monsoon phenomenon via geodetic sensors</i> in the Inter Commission Committee for Climate of the International Association of Geodesy with participants from 10 different countries. He serves as a reviewer for a number of leading journals in the domain of geodesy and geosciences.	
Research Interest Keywords: Environmental geodesy, Future Satellite Missions, Signal processing on the sphere, Low-cost geodetic sensors, Data analysis and assimilation	
Summary of Research Interests: His current research interests are in the area of developing low-cost geodetic sensors for environmental monitoring, designing future satellite missions for studying the Earth's gravity variations, using geodetic sensors to study environmental and geophysical processes, and analysing and processing signals emanating from spherical entities.	
Smart City Themes of Interest: Infrastructure and Technology; Energy, Waster and Water; Security and Safety	
Related Publications: Please see the website	
Related Grants: <i>Development of low-cost continuously operating GNSS stations for environmental monitoring</i> Initiation grant, IIT Kanpur. (2019-2021)	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Bharat Lohani	Position: Professor, Civil Engineering
Email: blohani@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: https://www.linkedin.com/in/bharatlohani/	
Short Bio: Dr. Bharat Lohani earned his PhD from the University of Reading, UK in 1999. Presently he is Professor at IIT Kanpur. He joined IIT Kanpur as an Assistant Professor in the Department of Civil Engineering in December 2002. Dr. Lohani has taught courses in remote sensing, GPS, GIS, image processing, LiDAR, photogrammetry and land surveying. Besides, he has also conducted several continuing education programmes at IIT Kanpur on LiDAR technology. Dr. Lohani has published over 100 research papers and articles in journals of repute and delivered over 60 invited talks. He is recipient of several awards and recognitions including 'ISRS Geospatial Excellence Award', 'Fellow of Indian Society of Remote Sensing', and 'Fellow Institution of Surveyors'. Dr. Lohani has spearheaded the development and implementation of LiDAR technology in India through persistent efforts with government and private sector. To promote the use of LiDAR technology in India he founded Geokno India Pvt. Ltd. at IIT Kanpur, which is now leader in this domain with large number of successful projects behind it.	
Research Interest Keywords: Civil Engineering, LiDAR, Photogrammetry, 3D Modelling, GIS, GNSS, Laser Scanning	
Summary of Research Interests: Dr. Lohani mainly focusses on modeling of physical environment using high resolution remotely sensed data, with special emphasis on airborne, mobile and terrestrial LiDAR data and photographs. He uses these data for various innovative applications including smart city. Dr. Lohani's current research interest are in LiDAR Data Classification using Deep Learning Techniques, Solar Insolation Estimation, GIS and Soft Computing for Land Consolidation, and UAV Data Capture and processing.	
Smart City Themes of Interest: Urban Planning; Security and Safety; Cultural Heritage; Energy, Waste and Water	
Related Publications:	
Related Grants:	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Bishakh Bhattacharya	Position: Professor Teaching and Research, Mechanical Engineering and Cognitive Science
Email: bishakh@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: http://home.iitk.ac.in/~bishakh/	
Short Bio: <p>Dr. Bishakh Bhattacharya is a Professor of Mechanical Engineering department and professor and Head of Cognitive Science in the Indian Institute of Technology Kanpur (IITK). His area of research includes: Active and Passive Vibration Control, Structural Health Management, Design of Energy Harvesting System, Intelligent System Design and Child-Robot Interaction Design. Based on his work on Shape Memory Actuator, a new technology is developed for shape control of reconfigurable flexible parabolic antenna system for the Indian Space Research Organization (ISRO). Another notable application of his work on Structural Health Management is in developing Energy Harvesting Pipe Health Monitoring robots for the Gas Authority of India (GAIL).</p> <p>Among other activities, he served as the Head of the Design Programme at IIT Kanpur from 2011-2013. He was also coordinator of the Space Technology Cell of the Institute since 2013. He has developed and in charge of the Smart Materials and Systems Laboratory. He is an Associate editor of the International JI. of Systems Science from Taylor and Francis and ISSS JI. of Micro and Smart Systems from Springer. He is also an Editorial board member of the Journal of Low Frequency Noise and Vibration and control.</p>	
Research Interest Keywords: Vibration Control, Shape Control, Smart Sensors, Smart Actuators, Intelligent Robots, Cognitive Robots, Social Robots, Structural Health Monitoring, Intelligent Product Design	
Summary of Research Interests: <p>Beginning with modelling and experimental studies of smart structures, we have diverged to a broader field of enabling smart technology through synthesis. Powered by these extensive knowledge of applications, we are converging to develop intelligent and cognitive systems with varied applications for the society. Our Interdisciplinary research experience cuts across the fields of Applied Dynamics, Robotics, Solid Mechanics, Sensors and Actuators, Functional Materials and Cognitive Science.</p>	
Smart City Themes of Interest: Infrastructure and Technology; Mobility and Transport; Health and Well being; Food Security and Agriculture; Energy, Waste and Water	
Related Publications: <p>Dwivedi, A., Banerjee A. and Bhattacharya, B., Simultaneous energy harvesting and vibration attenuation in piezo-embedded negative stiffness metamaterial, Journal of Intelligent Material Systems and Structures , 2020-03-06, DOI: 10.1177/1045389X20910261.; Bhaskar, J., Sharma, A. K., Bhattacharya, B. and Adhikari, S., A review on Shape Memory Alloy Reinforced Polymer Composite Materials and Structures, Smart Materials and Structures, https://doi.org/10.1088/1361-665X/ab8836; Adhikari, S., Rastogi, A. and Bhattacharya, B., Piezoelectric vortex induced vibration energy harvesting in a random flow field, Smart Materials and Structures, https://iopscience.iop.org/article/10.1088/1361-665X/ab519f; Santhakumar S. , Bhattacharya , B., Aryan, P. and Sohn H., (2019), A Real-Time, Non-Contact Method for In-Line Inspection of Oil and Gas Pipelines Using Optical Sensor Array, Sensors 2019, 19, 3615; https://doi.org/10.3390/s19163615; Sharma, A. K., Bhattacharya, B. (2019), Parameter estimation of butyl rubber aided with dynamic mechanical analysis for numerical modelling of an air-inflated torus and experimental validation using 3D-laser Doppler Vibrometer, Journal of Low Frequency N; Kalra, S., Bhattacharya, B. and Munjal, B. (2017), Design of Shape Memory Alloy Actuated Intelligent Parabolic Antenna for Space Applications, Smart Materials and Structures, https://doi.org/10.1088/1361-665X/aa7468.; Datta R., Jain A., Bhattacharya B. (2015): A piezoelectric model based multi-objective optimization of robot gripper design, Structural and Multidisciplinary Optimization, DOI 10.1007/s00158-015-1340-y.; Roy K., Bhattacharya B., Ray-Chaudhuri S., (2015): ARX model-based damage sensitive features for structural damage localization using output-only measurements, Journal of Sound and Vibration, Vol. 349, pp. 99-122.; Roy K., Ogai H., Bhattacharya B., Roychoudhuri S. and Qin J. (2012) Damage Detection of Bridge using Wireless Sensors, Proc. IFAC MMM-2012, Vol. 2 Part1, pp. 107-111.</p>	
Related Grants: <p>Design & Development of Aquatic Autonomous Observatory (Niracara Svayamsasita Vedhshala-Nsvs) for In Situ Monitoring, Real Time Data Transmission & Web Based Visualization (IUSSTF); Design And Development of Adaptive Intelligent Phmr For Fuel Transportation Systems (MHRD/UAY); Shape Memory Alloys Actuated Mechanically Active Reconfigurable Lightweight Peekmaterial based Parabolic Reflector for Active Control on Rf Patterns Forhigh Frequency Micro/Nano Spacecraft Application (STC); Seamless Affordable Assistive Technology for Health (SAATH) (DBT) - [2014-2018]; Design of A Smart Inflated Torus and Antenna Membrane (STC) -[2014-2018] ; Design And Development Of Autonomous Robot For Crop-Monitoring And Localised Pest Neutralisation; Neuro-Cognitive Instrumentation Of Validated Human-Robot Interactions To Enhance Learning And Developmental Processes In Children; Cognitive Robotics Based Study Of Child-Robot Interaction (Cr)-Characterization Of Critical Parameters And Interaction Design; Design And Development Of A Miniature Rotary Actuator Based On Flexinol Sma; Development Of An Intelligent Sit-O-Stand (Sts) And Mobility Support System For The Elderly</p>	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Chinmoy Kolay	Position: Assistant Professor, Civil Engineering
Email: ckolay@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: https://sites.google.com/view/ckolay	
Short Bio: Dr. Chinmoy Kolay is an assistant professor in the Department of Civil Engineering at the Indian Institute of Technology (IIT) Kanpur. Before joining IIT Kanpur, he was a research scientist at Lehigh University (2016-17), on the faculty of KIIT University (2009-11), and a graduate engineer trainee of Larsen & Toubro (2006-07). His research interests include structural behaviour under extreme loads, hybrid simulation, and supplemental damping devices. Dr. Kolay received a B.E. (First Class with Honours) from Jadavpur University (2006), an M.Tech. from IIT Kanpur (2009), and a Ph.D. from Lehigh University (2016). He is a member of ASCE and EERI. At IIT Kanpur, Dr. Kolay teaches courses on structural dynamics, earthquake engineering, experimental methods, design of steel structures and mechanics of solids.	
Research Interest Keywords: Behaviour of structures under extreme load events (e.g., earthquake, windstorm, and blast), Supplemental damping devices, Real-time hybrid (pseudo-dynamic) simulation, Structural dynamics and control, Nonlinear structural analysis, Numerical techniques, Renewable building material, Soil-structure interaction, ,	
Summary of Research Interests: Dr. Kolay's research interests include structural behaviour under extreme loads, supplemental damping devices for mitigation of seismic and wind hazards, real-time hybrid (pseudo-dynamic) simulation, structural dynamics and control, nonlinear structural analysis, numerical techniques, soil-structure interaction, and renewable building material. He has published his research in several international journals of repute and presented in many international conferences.	
Smart City Themes of Interest: Infrastructure and Technology	
Related Publications: Al-Subaihawi, S., Kolay, C., Marullo, T. M., Ricles, J. M., and Quiel, S. E. "Assessment of Wind-Induced Vibration Mitigation in a Tall Building With Damped Outriggers Using Real-Time Hybrid Simulations". In: Engineering Structures (2019). (in press); Kolay, C., Al-Subaihawi, S., Marullo, T. M., Ricles, J. M., and Quiel, S. E. "Multi-Hazard Real-Time Hybrid Simulation of a Tall Building with Damped Outriggers". In: International Journal of Lifecycle Performance Engineering (Special Issue on Hybrid Simulation for Multi-Hazard Engineering) (2019). (in press); Fu, B., Kolay, C., Ricles, J.M., Jiang, H. and Wu, T. "Stability analysis of substructure shake table testing using two families of model-based integration algorithms", In: Soil Dynamics and Earthquake Engineering, 126 (2019), p. 105777. doi: 10.1016/j.so; Kolay, C. and Ricles, J. M. "Force-Based Frame Element Implementation for Real-Time Hybrid Simulation Using Explicit Direct Integration Algorithms". In: Journal of Structural Engineering 144.2 (2018), p. 04017191. doi: 10.1061/(ASCE)ST.1943-541X.0001944.; Kolay, C. and Ricles, J. M. "Improved Explicit Integration Algorithms for Structural Dynamic Analysis with Unconditional Stability and Controllable Numerical Dissipation". In: Journal of Earthquake Engineering (2017). doi: 10.1080/13632469.2017.1326423.; Kolay, C. and Ricles, J. M. "Assessment of explicit and semi-explicit classes of model-based algorithms for direct integration in structural dynamics". In: International Journal for Numerical Methods in Engineering 107.1 (2016), pp. 49–73.; olay, C., Ricles, J. M., Marullo, T. M., Mahvashmohammadi, A., and Sause, R. "Implementation and application of the unconditionally stable explicit parametrically dissipative KR-alpha method for real-time hybrid simulation". In: Earthquake Engineering an; Kolay, C. and Ricles, J. M. "Development of a family of unconditionally stable explicit direct integration algorithms with controllable numerical energy dissipation". In: Earthquake Engineering and Structural Dynamics 43.9 (2014), pp. 1361–1380. doi: 10.1; Kolay, C., Prashant, A., and Jain, S. K. "Nonlinear Dynamic Analysis and Seismic Coefficient for Abutments and Retaining Walls". In: Earthquake Spectra 29.2 (2013), pp. 427–451. doi: 10.1193/1.4000141.	
Related Grants: Title: Structural Control Using Tuned Liquid Dampers: An Investigation Through Real-Time Hybrid Simulation Sponsor: Council of Scientific and Industrial Research (CSIR) Grant: Rs. 26,35,000 Period: 3 years; Title: Real-Time Hybrid Simulation: Implementation, Validation and Application to Multi-Hazard Performance Assessment of Buildings Outfitted with a Novel Damping Device Sponsor: Science & Engineering Research Board (Early Career Research Award) Grant: R; Title: Development of a framework for real-time hybrid simulation of structural response to multiple hazards at the Pseudo-Dynamic Testing Facility of IIT Kanpur Sponsor: IIT Kanpur (Initiation Grant Scheme) Grant: Rs. 25,00,000 + Rs. 59,09,812 (Special Grant for Upgrading the Pseudo-Dynamic Testing Facility) Period: 2018-2020	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Dibakar Ghosal	Position: Assistant Professor, Department of Earth Sciences
Email: dghosal@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: http://home.iitk.ac.in/~dghosal/Home.html	
Short Bio: Dibakar is a controlled source seismologist by practice. In his research, he uses land and marine geophysical datasets acquired either by industries or academic institutions for modeling and imaging of subsurface fossil-fuel reservoir to crustal scale structural features. During his PhD in Institut de Physique du Globe de Paris (IPGP) he processed marine geophysical datasets to image shallow structural details below the northern Sumatra subduction system and later on, during his postdoctoral research from Uppsala University, he worked on frequency dependent poro-elastic response of hydrocarbon reservoirs. Besides the geophysical data processing, he has keen interest in developing algorithms for state-of-the-art processing of seismic datasets.	
Research Interest Keywords: Controlled source seismology, ambient noise tomography, convergent plate margins, modelling and inversion, poro-elasticity	
Summary of Research Interests: Dibakar's primary research focuses modelling and imaging of shallow subsurface structures either analysing controlled source seismological datasets or ambient noise datasets. He has keen interest in developing algorithms for advanced processing of seismic datasets.	
Smart city theme of interest: Infrastructure and Technology; Urban Planning; Cultural Heritage; Energy, Waste and Water	
Related publication: (8) Jain V., Ghosal D., Verma S., (2020). Enhancement of a thumper source far offset refracted phases using super virtual interferometry (SVI), J. Earth Syst. Sci., 129:136. (7) Boral S., Sen I S., Ghosal D., Peucker-Ehrenbrink B., Hemingway J. D., (2019). Stable water isotope modeling reveals spatio-temporal variability of glacier meltwater contributions to Ganges River headwaters, Journal of Hydrology, 577, 123983. (6) Hananto N., A Boudarine, H Carton, SC Singh, P Avianto, J Dymont, Y Qin, D Ghosal, R Zuraida, P E Tapponnier, C Deplus, K Sieh, (2018). Evidence of pervasive trans-tensional deformation in the northwestern Wharton Basin in the 2012 earthquakes rupture area, Earth and Planetary Science Letters, 502, 174-186. (5) Ghosal D., Ganguli SS, Singh RN, Sain K, (2018). Simulating the gas hydrate behavior at equilibrium dissociation: A study from Mahanadi basin of eastern offshore, India, Marine and Petroleum Geology, 98, 802-814. (4) Ghosal D., C Juhlin, (2018). Estimation of dispersion attributes at seismic frequency—a case study from the Frigg-Delta reservoir, North sea, Journal of Geophysics and Engineering, 15 (5), 1799. (3) Ghosal D., Singh S.C, Martin J, (2014). Shallow subsurface morphotectonics of the NW Sumatra subduction system using an integrated seismic imaging technique, Geophysical Jour. Int., 198, 1818-1831. (2) Ghosal D., Singh S.C., Chauhan A.P.S, Hananto N.D., (2012). New insights on the offshore extension of the Great Sumatran fault, NW Sumatra, from marine geophysical studies, Geochem. Geophys. Geosys., 13, 11, doi: 10.1029/2012GC004122. (1) Singh. S.C, Chauhan A.P.S, Calvert A. J., Hananto N.D., Ghosal D., Rai A., Carton H., (2012). Seismic evidence of bending and unbending of subducting oceanic crust and the presence of mantle megathrust, Earth and Planetary science letters, 301.	
Related Grants: Estimation of poroelastic properties of hydrocarbon reservoirs using frequency dependent amplitude variation with offset (AVO) analysis [ONGC-India], PI, Grant: ~47L. Duration: 2 years; Modeling of Gas hydrate reservoir using integrated techniques [ONGC-India], PI, Grant: ~65L. Duration: 3 years; Delineation of shallow subsurface morphotectonics below the central seismic gap-Himalaya using an integration of passive and controlled source seismology [DST-India], PI, Grant: 53L. Duration: 3 years; Shallow subsurface seismic imaging of NE Himalayan foothills near Shillong plateau [IITK], PI, Grant: 25L. Duration: 3 years.	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Jillet Sarah Sam	Position: Assistant Professor, Humanities and Social Sciences
Email: jssam@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: http://www.iitk.ac.in/new/jillet-sarah-sam	
Short Bio: Jillet is a sociologist. After completing her PhD from the University of Maryland, she joined the Indian Institute of Technology as an Assistant Professor in 2015. In the recent past, she has been granted research funding by FORMAS, Sweden for a project on gendered aspects of monetary digitization in north India (with Anna Aberg and Anwesha Chakraborty). In 2020, she received the Bando Struttare funding (with Piergiorgio Degli Esposti) from the University of Bologna for a project on the evolution of consumer behaviour due to digitalization. Her recent publications have focused on the digitization of money in India. She is currently putting together a special issue on "Cashlessness in India: Vision, Policy and Practise" for the journal Telecommunications Policy.	
Research Interest Keywords: digital society; cryptocurrency; digital payments; AI; platforms; sociology of consumption; smart cities; neighbourhoods; sociology of money; mobility	
Summary of Research Interests: Research interests include the sociology of money, digital societies, sociology of consumption and social geography. Currently I am exploring two distinct streams - the digitization of money in India, and the unfolding of platforms economies and digital payments at the level of the neighbourhood. In both these streams I am exploring themes related to continuities with pre-digital social practices, the generation of social trust and inclusion/exclusion.	
Smart City Themes of Interest: Infrastructure and Technology; Mobility and Transport; Urban Planning; Cultural Heritage	
Related Publications: <ol style="list-style-type: none"> Sam, Jillet and Anwesha Chakraborty. 2019. "Sense-making of digital money among female peripheral agents: a short ethnographic study of informal workers in North India." <i>Sociologia del Lavoro</i>. 154 : 60-78 Sam, Jillet. 2017. "Caste Diasporas beyond National Boundaries: Digital Caste Networks." <i>Perspectives on Global Development and Technology</i>. 16 (1-3): 145-159 Sam, Jillet. 2012. "Globalization and Layered Spaces: The Case of Hitec City in India." <i>Perspectives on Global Development and Technology</i>. 11(4): 480-512 	
Related Grants: <ol style="list-style-type: none"> 2020-2021: "Evolution of Consumer Behaviour: The Impact of Digitalization and Cryptocurrency upon Consumption Practices, a Comparative study between Italy and India." BANDO STRUTTARE Mobility Grant. Co-PI: Dr Piergiorgio degli Esposti (University of Bologna, Italy) 2018-2019: Women and Monetary Digitization in North India FORMAS STINT Mobility Grant. Co-PIs: Dr Anna Aberg and Dr Anwesha Chakraborty (Chalmers University of Technology, Gothenburg, Sweden) 	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: K V Harish	Position: Assistant Professor, Department of Civil Engineering
Email: kvharish@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: https://www.iitk.ac.in/new/harish-k-venkatanarayanan http://home.iitk.ac.in/~kvharish/	
Short Bio: K.V.Harish is currently working as an Assistant Professor in the Dept. of Civil Engg, at IIT Kanpur. He is a University Rank Holder in his B.Engg. and Gold Medalist in his M.Engg. degree. After his Master's education, he worked as a Scientist for about 2 years in Structural Engineering Research Centre, CSIR, India before he left for his Ph.D degree at Clemson University. In his doctoral research, he was awarded the ACI-BASF Construction Chemical Student Fellowship for the 2010-2011 year. He worked in different construction materials project related to sustainability and reducing carbon foot-print during his doctoral and post-doctoral periods at Clemson University. Currently, he has about 15 international journals and several conference proceedings (See the main CV for detailed list of publications). He joined IIT Kanpur in 2014 and has both teaching and research experience. He has guided 20 M-tech students, currently guiding 7 Ph. D and 5 M-tech students. He has created a new PG program, 'Infrastructure Engg. And Management' in his department along with Prof. Sudhir Mishra and other faculties. He has been as PI and Co-PI in several projects during the last 5 years focusing primarily on microstructure of cement based materials and non-destructive testing of concrete structures. He is an active reviewer in several International and National Journals and has taken several departmental and institutional responsibilities.	
Research Interest Keywords: Environmental Conservation, Urban Planning, Sustainable Construction Materials, Novel Binders for Construction, New Technologies for Construction, Repair and Rehabilitation of Concrete Structures, Microstructure of Cement Based Materials	
Summary of Research Interests: The interested research areas include development of sustainable construction materials, environmental conservation from construction background, repair and rehabilitation of construction materials, etc. I am working in the following research areas in Construction Materials field <ol style="list-style-type: none"> 1. Microstructure of Cement-based Materials 2. Material Characterization Techniques 3. Advanced Cementitious Materials 4. Sustainable Construction Materials 5. Repair and Rehabilitation of Concrete Structures 6. Life Cycle Cost Analysis of Materials and Processes 	
Smart City Themes of Interest: Infrastructure and Technology; Economic Development; Urban Planning; Cultural Heritage	
Related Publications: Harish, K.V., and Rangaraju, P.R. "Effect of grinding of low-carbon rice husk ash on the microstructure and performance properties of blended cement concrete," Cement and Concrete Composites, Elsevier Journal, Vol.55, Jan. 2015, pp. 384-363.; Harish, K.V. and Rangaraju, P.R., "Evaluation of sulfate resistance of low-carbon rice husk ash portland cement mortars," Journal of Materials in Civil Engineering, ASCE, Vol. 26, 4, April 2014, pp. 582-592.; Harish, K.V. and Rangaraju, P. R. "Material characterization studies on low- and high- carbon rice husk for use in portland cement mixtures," Advances in Civil Engineering Materials, ASTM Journal, May 2013, Vol. 2, 1, pp. 266-287.; Manoj Kumar, and Harish K.V. "Performance of self-compacting cement based mortars for certain precast applications," Journal of Materials in Civil Engineering, American Society of Civil Engineers (ASCE), (in press Nov. 2019).; Madhurima and Harish, K.V. "An integrated approach for studying the hydration of portland cement systems containing silica fume", Construction and Building Materials, Elsevier Journal, Vol. 188, Nov. 2018, pp. 1179-1192; Harish, K.V., Dattatreya, J.K., and Neelamegam, M. "Experimental investigation and analytical modeling of the characteristics of heat-treated ultra-high strength mortars produced from conventional materials," Construction and Building Materials, Elsevier Journal, Vol. 43, Oct. 2013, pp. 54-68.; Harish, K.V., Dattatreya, J.K., Neelamegam, M., "Effect of fiber addition, heat treatment and pre-set pressure on strength properties of ultra-high-strength mortars," Journal of the Transportation Research Board Conference (TRR), May 2011, Vol. 2240/2011; Harish, K.V., Rangaraju, P. R., Vempati, R., "Fundamental investigations into performance of a carbon neutral rice husk ash as a SCM," Journal of the Transportation Research Board Conference (TRR), May 2010, Vol. 2164/2010, pp. 26-35.	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Related Grants:

Beneficial utilization of sustainable industrial waste for the development of self-compacting cement based precast panels, MHRD, Govt. of India, 2017-2020, 14.8 lakhs;

Development and material characterization of ultra-high strength cementitious material produced using local materials, IIT Kanpur, 2015-2017;

Structural Audit of Punjab National Bank (PNB) Building, New Delhi (Project No. 2016451), PNB, Delhi, Dec. 2016-Dec. 2018;

Condition Assessment of structural members of ALIMCO canteen building (Project No. 2016323), ALIMCO, Kanpur, Dec 2016 to Mar. 2017;

Development of High-Strength/High Performance Concrete/Grout Mixtures for Application in Shear Keys in Precast Bridges, South Carolina DOT, USA, Feb. 2013 to Jan. 2014;

Development and materials characterization of ultra-high strength cementitious material produced using local materials, IIT Kanpur, 2014-2017, 25 lakhs;

Non-destructive testing and analysis of concrete and masonry structures

(a) Structural Audit of Punjab National Bank (PNB) Building, PNB, New Delhi, Dec. 2016-Dec. 2018, 9.27 lakhs

(b) Structural Safety and Analysis of ALIMCO Admin Building, ALIMCO, Dec; Effect of aggregate gradation on properties of concrete, South Carolina, DOT, USA, Oct. 2011 to Jan. 2013;

Development and Characterization of a carbon-neutral rice husk ash as a supplementary cementing material in concrete, National Science Foundation Grant, USA;

“Technologies and Methodologies in Prevention of ASR in Concrete Pavements: Phase I - Effectiveness of Fly ash and its Blend with Lithium Admixture in Mitigating ASR in Concrete - Role of Chemical, Physical and Mineralogical Aspects,” prepared for the Off

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Kallol Mondal	Position: Professor Teaching and Research, Materials Science and Engineering
Email: kallol@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: http://iitk.ac.in/new/kallol-mondal	
Short Bio: <p>Kallol Mondal is a product of Bengal Engineering College Shibpur, West Bengal, where he has got his B.E. in Metallurgy in 1995. Later he did his M.Tech and PhD from Metallurgical and Materials Engineering from Indian Institute of Technology, Kharagpur, in the year 1998 and 2005, respectively. In between he served TELCO Jamshedpur for three years. After completing PhD, he stayed at NIMS, Japan for his Postdoc from 2005-2007 and joined Department of Materials Science and Engineering in December 2007 as an Assistant Professor. Later he was promoted to Associate Professor in 2012 and Professor in 2016.</p> <p>His research interest lies in Physical Metallurgy, Corrosion and Oxidation of Metals and Alloys and Glassy alloys. He has been actively involved in developing improved steels for rails and clips for Indian Rail. More recently, he has started working on the development of nano-porous metal particles and templates. He is an expert in Corrosion in India.</p> <p>He has strong collaboration with Industries as well as research laboratories like, Tata Steels, Indian Ordnance Factory and National Metallurgical Laboratory. He has initiated interests in pig iron for possible use as strong coating as well as sacrificial anode. Moreover, he has good number of sponsored as well as consultancy projects.</p> <p>Till date 8 PhD and thirty four M.Tech students have graduated under his mentorship. He has published more than 100 papers in peer reviewed International journals and applied for 16 Indian Patents.</p>	
Research Interest Keywords: Physical Metallurgy, Thermodynamics, Corrosion, Inhibitor for corrosion protection	
Summary of Research Interests: <p>His research interest lies in Physical Metallurgy, Corrosion and Oxidation of Metals and Alloys and Glassy alloys. He has been actively involved in developing improved steels for rails and clips for Indian Rail. More recently, he has started working on the development of nano-porous metal particles and templates.</p>	
Smart City Themes of Interest: Infrastructure and Technology	
Related Publications: <p>Prasanna Kumar Behera, K. Mondal and Sudhir Misra (2020), Simulating reinforcement corrosion-induced strain in concrete using expansive grouts, Current Science vol 118, 401-410.; Prasanna Kumar Behera, Sudhir Misra and myself (2020), Corrosion behaviour of strained rebar in simulated concrete pore solution, J. Mater Eng. Perform., vol 29, 1939-1954.; Prvan Kumar Katiyar, Prasanna Kumar Behera, Sudhir Misra and K. Mondal (2019), Comparative corrosion behavior of five different microstructures of rebar steels in simulated concrete pore solution with and without chloride addition, J. Mater Eng. Perform.,; B.P. Kumar, A.P.Moon, K. Mondal, S. Misra (2016): Estimating critical corrosion for initiation of longitudinal cracks in RC structures considering phases and composition of corrosion products, ASCE's J. Mater. Civil Eng. 04016158; PP 1-12.; Prabhat K. Rai, D. Naidu, B. Satapathy, K. Sarkar, A. S. Pathak, P. Bijalwan, M. Dutta, A. Banerjee, K. Mondal (2020), Amorphous/nanocrystalline composite coatings using blast furnace pig iron composition by atmospheric plasma spray and their electrochem; Prabhat K. Rai, B. Satapathy, K. Sarkar, P. Bijalwan, M. Dutta, A. Banerjee and K. Mondal (2020), Experimental validation of glass forming ability of melt spun ribbons of pig iron and its derivative compositions and their corrosion behaviour, J. Non-Cryst</p>	
Related Grants: <p>Rutag sub project (Solar power evaporative cooler for vegetable storage) (~2.15 lakhs), 2015-16. Rutag India, IIT Kanpur. Continuing. (PI)</p>	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Kamal Krishna Kar	Position: Professor, Department of Mechanical Engineering
Email: kamalkk@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: http://home.iitk.ac.in/%7Ekamalkk/index.htm	
Short Bio: Prof. Kamal K. Kar, Department of Mechanical Engineering and Materials Science is Umang Gupta Chair Professor from July 2014 to June 2017. He was born on 5th November 1968 in Patna, a small village in the East Midnapur of West Bengal. He had his early educations in his village, Khakurda, West Midnapur. Subsequently, he pursued higher studies from Indian Institute of Technology Kharagpur, India, and Iowa State University, USA before joining as a Lecturer in the Department of Mechanical Engineering and Materials science at IIT Kanpur in 2001. He was a BOYSCAST Fellow in the Department of Mechanical Engineering, Massachusetts Institute of Technology, USA in 2003 (May-December). He was promoted to an Assistant Professor in 2002, Associate Professor in 2007 and Professor in 2012. He was a Head of Interdisciplinary Programme in Materials Science. Prof. Kar is an active researcher in the area of nanostructured carbon materials, nanocomposites, functionally graded materials, nanopolymers, and smart materials for structural, energy and biomedical applications. Prof. Kar has published more than 215 papers in international referred journals, 135 conference papers, 05 books on nanomaterials and their nanocomposites, 35 review articles/book chapters and more than 57 national and international patents.	
Research Interest Keywords: Energy, water, bioimplant	
Summary of Research Interests: Prof. Kar is an active researcher in the area of nanostructured carbon materials, nanocomposites, functionally graded materials, nanopolymers, and smart materials for structural, energy and biomedical applications.	
Smart City Themes of Interest: Energy, Waste and Water	
Related Publications: Title: Recent progress in the synthesis of graphene and derived materials for next generation electrodes of high performance lithium ion batteries Authors: RajeshKumar, Sumanta Sahoo, Ednan Joanni, Rajesh Kumar Singh, Wai Kian Tan, Kamal Krishna Kar an; Title:Recent advances in thermoelectric materials Authors: Chhatrasal Gayner and Kamal K. Kar References: Progress in Materials Science, Vol.:83, Pages: 330-382, Year:2016, DOI: doi:10.1016/j.pmatsci.2016.07.002, ISSN 0079-6425, Elsevier B.V., UK (IF-23.725 (2018)/5 year IF:33.018); Title:Hierarchical 3D brush-like electrodes consisting of oxidized -carbon nanotube/polypyrrole nanocomposite for flexible supercapacitors with super-long cyclic stability Authors: Cherusseri Jayesh and Kamal K. Kar References: Journal of Materials Ch; Title: Effects of structural disorder and nitrogen content on ORR electrocatalytic activity of CNx synthesized by pyrolysis of polyvinylpyrrolidone Authors: Raghunandan Sharma and Kamal K. Kar References: Journal of Materials Chemistry A, Vol.:3, Pages: 11948-11959, Year:2015, DOI: 10.1039/c5ta02097b, ISSN 2050-7488 (print), ISSN 2050-7496 (online), Royal Society of Chemistry, UK (IF-10.733 (2018)); Title: Hierarchically mesoporous carbon nanopetal based electrodes for flexible supercapacitors with super-long cyclic stability Authors: Cherusseri Jayesh and Kamal K. Kar References: Journal of Materials Chemistry A, Vol.:3, Pages: 2158621598, Year; Title:Facile development strategy of a single carbon fiber based all solid state flexible lithium ion battery for wearable electronics Authors: Amit Yadav, Bibekananda De, Sandeep Singh, Prerna Sinha and Kamal K Kar Reference: Applied Materials and In; Title: A facile methodology for the development of a printable and flexible all-solid-state rechargeable battery Authors: Bibekananda De, Amit Yadav, Salman Khan, and Kamal K. Kar Reference: Applied Materials and Interfaces, ISSN: 1944-8244, Vol.: 9, N; Title: Aluminum substituted cobalt ferrite (Co-Al-Fe) nano adsorbent for arsenic adsorption in aqueous systems and detailed redox behavior study with XPS Authors: Yaswanth K. Penke, Ganapathi Anantharaman, Janakarajan Ramkumar, and Kamal K. Kar Referen; Title: Helically coiled carbon nanotube electrodes for flexible supercapacitors Authors: Jayesh Cherusseria, Raghunandan Sharma and Kamal K. Kar References: Carbon, Volume: 105, pp 113-125, Year: 2016, ISSN:0008-6223, DOI:10.1016/j.carbon.2016.04.019, A	
Related Grants: Title:Nanostructured carbon decorated with metal nanoparticle loaded metal doped monochalcogenide thermoelectric with remarkable ZT and power factor: Performance evaluation with commercially available thermoelectric devices Name of Investigator: Kamal K. Kar (PI), Raghunandan Sharma and Malay K. Das Durations: 3 years (2016-2019) Reference # Department of Science and Technology, DST/TMD/MES/2k16/37; Title: Development of high power density polymer electrolyte membrane fuel cell (PEMFC) for space applications: Biomass-derived multidoped carbon/multihelix carbon nanotubes (MHCN) as catalyst support/Pt-free catalyst Name of Investigator: Kamal K. K; Title: Prototype heart-valve Name of Investigator: Kamal K. Kar (PI) Durations: 2years (2016-2018) Reference # Ministry of Human Resource and Development, MHRD/ME/20161421; Title: Development of advanced carbon carbon composites Name of Investigator: Kamal K. Kar (PI) Durations: 3 years (2015-2018) Reference # Department of Atomic Energy,BRNS/MSP/2014370; Title: Carbon nanostructure reinforced composites for structural applications Name of Investigator: Kamal K. Kar (PI) Durations: 3 years (2013-2016) Reference # Indian Space Research Organization (ISRO), STC/MSP/20110039; Title: Novel multifunctional nanocomposites made of epoxy reinforced with carbon nanocoil coated carbon fiber for structural applications Name of Investigator: Kamal K. Kar (PI) Durations: 3 years (2010-2013)	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Reference # Department of Science and Tec;

Title: Development and performance evaluation of carbon nanocoil structure for the catalyst support in PEM fuel cell

Name of Investigator: Kamal K. Kar (PI) and M.K. Das, A.K. Saha Durations: 3 years (2010-2013)

Reference # Department of Science and;

Title: Development of carbon nanostructure reinforced bipolar plates made of phenolic resin and carbon fiber for the PEM fuel cells: Performance evaluation Name of Investigator: Kamal K. Kar (PI) and M.K. Das Durations: 2 years (2011-2013)

Reference;

Title: Development of carbon nanotube coated backing structure/bipolar plate (exfoliated carbon nanostructure reinforced phenolic nanocomposites) for the PEM fuel cell Name of Investigator: Kamal K. Kar (PI) and M.K. Das, A.K. Saha Durations: 2 year;

Title: Performance evaluation of carbon nanotube coated carbon fiber reinforced carbon composites (carbon-carbon-carbon composites) for structural applications Name of Investigator: Kamal K. Kar (PI) Durations: 3 years (2008-2011)

Reference # Aeronautics

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Kantesh Balani	Position: Professor Materials Science and Engineering
Email: kbalani@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: http://home.iitk.ac.in/~kbalani/	
<p>Short Bio: Dr Kantesh Balani is currently a full Professor (since Nov. 2018) in the Department of Materials Science and Engineering (MSE) at Indian Institute of Technology (IIT) Kanpur, where he had joined in year 2008. He earned his doctorate (Ph.D.) from Florida International University, Miami, FL, in year 2007. He has published over 150 articles in the peer-reviewed international journals (with citations of over 5500 and h-index of 35) and has delivered over 130 lectures in the international and national conferences. He has co-authored two books on “Advanced Structural Ceramics” (Wiley, 2011), and “Biosurfaces: From the Perspective of Materials Scientist and Engineer” (Wiley, 2015).</p> <p>He is recipient of several fellowships and prestigious awards such as 2018 ASM-IIM Visiting Lecturer award by ASM International, USA, elite Swarnajayanti Fellowship 2017-22 by Department of Science and Technology, Govt. of India, Metallurgist of The Year 2016 (Metal Science) by Ministry of Steels, Govt. of India, and few Young Scientist and Young Engineer Awards. Currently, he serves as Editor-in-chief of Nanomaterials and Energy journal, Principal Editor of “Journal of Materials Research”, and key reader for Metallurgical and Materials Transactions A, and is reviewer of over fifty technical journals. His research interests include nanomechanics and nanotribology of bio/nano composites, synthesis and processing of polymeric/ceramic nanocomposites, and energy materials.</p>	
Research Interest Keywords: Biomaterials; Health Technologies; Environmental Conservation	
<p>Summary of Research Interests: My research interest lies in the area of multi-functional biomaterials, which extends to health technologies. The impetus of my current work hovers on developing multifunctional and porous scaffolds for bone replacement and developing materials for hip-joint replacement. With biotribological aspects to assessing nanomechanical traits, we also dwell on surface characterisation (wettability & cellular attachment). The 3-D printing and bio-inks are fascinating and attractive as immediate focus.</p>	
Smart City Themes of Interest: Infrastructure and Technology; Health and Well being	
<p>Related Publications:</p> <ol style="list-style-type: none"> 1. S. Ariharan, R. Maurya, R.K. Sharma, V.K. Sharma, S. Lohia, Kantesh Balani, “Damage resistance of polypropylene based composites during progressive- and constant-load-scratching”, Polymer Composites, (Accepted Jul. 2020). 2. F. Alam, A. Kumar, V.R. Shukla, A. Nisar, and Kantesh Balani, “Multi-length Scale Wear Damage Mechanisms of Ultra-high Molecular Weight Polyethylene Nanocomposites”, Polymer Testing, Vol. 81 (2020), pp. 106210 (11pp). 3. R.K. Sharma, S. Lohia, V.K. Sharma, K.P. Singh, Kantesh Balani " Interfacial strengthening of polypropylene composites via bimodal porosity in Rice husk ash: Comparison with calcium carbonate reinforcement", Journal of Applied Polymer Science, Vol. 136 (no. 4) (2019) 46989 pp. 9. 4. C. Nayak, S. Ariharan, P. Kushram, Kantesh Balani, “Fretting of Aluminum Oxide, Hydroxyapatite and Carbon Nanotubes Reinforced Ultra High Molecular Weight Polyethylene”, Journal of Mineral, Metal and Material Engineering, Vol. 4 (2018), pp 22-34. 5. P. Nautiyal, F. Alam, Kantesh Balani, A. Agarwal, “The Role of Nanomechanics in Healthcare”. Advanced Healthcare Materials, 1700793, (2017) pp (28), DOI: 10.1002/adhm.201700793. 6. R. K. Sharma, A. Nisar, Kantesh Balani, “Mechanics of ZnO Morphological Dependence on Wear Resistance of Ultra High Molecular Weight Polyethylene”. European Journal of Mechanics- A/Solids, Vol. 65, (2017), pp. 149-158. 7. F. Alam, Kantesh Balani, “Role of silver/zinc oxide in affecting de-adhesion strength of Staphylococcus aureus on polymer biocomposites”. Materials Science and Engineering C, Vol. 75 (2017), pp. 1106-1114. 8. A.K. Patel, P. Trivedi, Kantesh Balani, “Carbon Nanotube Functionalization Decreases Osteogenic Differentiation in Aluminum Oxide Reinforced Ultrahigh Molecular Weight Polyethylene”. ACS Biomaterials Science & Engineering Vol. 2 (8), (2016), 1242-1256. 9. R.K. Sharma, M. Agarwal, Kantesh Balani, “Effect of ZnO Morphology on Affecting Bactericidal Property of Ultra High Molecular Weight Polyethylene Biocomposite”. Materials Science and Engineering C, Vol. 62 (2016), pp 843-851. 10. F. Alam, A. Kumar, A.K. Patel, R.K. Sharma, Kantesh Balani, “Processing, Characterization and Fretting Wear of Zinc Oxide and Silver Nanoparticles Reinforced Ultra High Molecular Weight Polyethylene Biopolymer 	
<p>Related Grants:</p> <p>Swarnajayanti Fellowship, Department of Science and Technology, Govt. of India (Mar. 2018-Mar. 2023): Rs. 136.38 Lakhs PI: “Hip Joint Replacement System”.</p> <p>Department of Biotechnology (DBT) (Nov. 2015-Nov. 2020) Rs. 11.41 lakhs (Total: Rs. 500.60 lakhs) Coordinator (IIT Kanpur): Programme Support on Translational Research on Biomaterials for Orthopaedic and Dental applications”</p> <p>Virtual Laboratory project – Phase II (MHRD) (Sep. 2014 – Apr. 2021) Rs. 145.6 Lakhs Coordinator: Integration of Virtual Labs at IIT Kanpur</p> <p>Department of Biotechnology (May 2009- Oct. 2012) Rs. 52.03 Lakhs PI: “Investigation on Developing Ultrahigh Molecular Weight Polyethylene-Hydroxyapatite -Carbon Nanotube Biocomposite for Biomedical Applications”</p>	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Lohia Corporation Limited (Jan. 2017 – Jan. 2018): Rs. 9.87 Lakhs

PI: "Investigation Of The Microstructural, Thermal And Mechanical Properties Of Polypropylene, Polyethylene And Polyurethane".

Lohia Corporation Limited (Feb. 2018 – Feb. 2019): Rs. 11.51 Lakhs

PI: "Investigation of the Microstructure, Phase and Degradation of Polymeric Materials – Phase II".

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Kanwar Singh Nalwa	Position: Assistant Professor, Materials Science and Engineering
Email: ksnalwa@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: http://home.iitk.ac.in/~ksnalwa/ https://www.linkedin.com/in/kanwar-nalwa-6362761a/	
Short Bio: Dr. Nalwa has done his B. Tech from Indian Institute of technology Kanpur in 2007, and PhD from Iowa State University, USA, in 2011. He has undertaken and successfully completed numerous research projects in diverse fields of hybrid Organic-Inorganic Opto-electronics, polymer ferroelectrics, memristive memory, light trapping for Solar cells, and Titania Nanotube synthesis. Prior to Joining IIT Kanpur as Assistant Professor, Dr. Nalwa was associated with Portland Technology Development (PTD) at Intel, Hillsboro, Oregon USA, where he was a Senior R&D Engineer in PVD and PECVD Metals module for more than 8 years. At Intel, he demonstrated new barrier for 14nm semiconductor technology and lead its process qualification and implementation, for which he received Intel Divisional award in 2013. He won two more Intel Divisional awards in 2015 and 2017 for his contributions to the development of Barrier/seed deposition technology in 10nm and 7nm CMOS process flows. Besides several journal publications and patent disclosures, he has received Research Excellence award for his PhD thesis at ISU in 2011 and Best Project Award for excellence in undergraduate research at IIT Kanpur in 2007.	
Research Interest Keywords: Energy harvesting and storage, Energy system integration, System to module level scaling, Hybrid solar cells, Li Ion based energy storage solutions	
Summary of Research Interests: My research experience is of an extremely holistic nature, encompassing the material, chemical, physical and electrical aspects of design, fabrication and characterization in energy harvesting and storage systems. My current area of Research includes Organic and inorganic semiconductors, energy storage materials, material interfaces, Perovskite based solar cells, all organic multifunctional Biochemical sensors.	
Smart City Themes of Interest: Energy, Waste and Water	
Related Publications: K. S. Nalwa, and S. Chaudhary, "Organic photovoltaic device with ferroelectric dipole and method of making same", U.S. Patent No. 10,038,142 (Granted July 31, 2018).; S. Chaudhary, K. M. Ho, J. M. Park, K. S. Nalwa, and W. Leung, "Textured micrometer scale templates as light managing fabrication platform for organic solar cells", U.S. Patent No. 9,401,442 (Granted July 26, 2016).; K. S. Nalwa, J. Carr, R. C. Mahadevapuram, H. K. Kodali, S. Bose, Y. Chen, J. W. B. Petrich, B. Ganapathysubramanian, and S. Chaudhary, "Enhanced charge separation in organic photovoltaic films doped with ferroelectric dipoles" Energy and Environmental Sc; K. S. Nalwa, J. M. Park, K. M. Ho, and S. Chaudhary, "On realizing higher efficiency polymer solar cells on a textured substrate platform", Advanced Materials, vol. 23, pp. 112-116, 2011. [Wiley-VCH. Impact factor 21.95] (Featured as news on materialviews.com); K. S. Nalwa, H. K. Kodali, B. Ganapathysubramanian, and S. Chaudhary, "Dependence of recombination mechanisms and strength on processing conditions in polymer solar cells" Applied Physics Letters, vol. 99, 263301, 2011. [American Physical Society. Impact-; K. S. Nalwa, A. Garg, A. Upadhyaya, "Effect of samarium doping on the properties of solid-state synthesized multiferroic bismuth ferrite", Materials Letters, Vol. 62 (06), pp 878-881, 2008; K. S. Nalwa, R. C. Mahadevapuram, and S. Chaudhary, "Growth rate dependent trap density in polythiophene:fullerene solar cells and its implications", Applied Physics Letters, vol. 98, 093306, 2011. [American Physical Society. Impact factor 3.49] Also in; K. S. Nalwa, Y. Cai, A. L. Thoeming, J. Shinar, R. Shinar, and S. Chaudhary, "Polythiophene-fullerene based photodetectors: tuning of spectral response and application in photoluminescence based bio(chemical) sensors", Advanced Materials, vol. 22, pp.; J. M. Park, K. S. Nalwa, W. Leung, K. Constant, S. Chaudhary, K. M. Ho, "Fabrication of metallic nanowires and nanoribbons using laser interference lithography and shadow lithography", Nanotechnology, Vol. 21(21), pp 215301, 2010	
Related Grants: Perovskite solar cells: moisture, thermal and photophysical stability improvement, SERB SRG, Feb 2020, Rs 30 Lakhs, PI (Submitted); Development of high efficiency and environmentally stable organic solar cells based on non-fullerene acceptors, IITK Research Initiation grant, March 2020, Rs 25 Lakhs, PI (Submitted)	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Krishnacharya	Position: Associate Professor, Physics
Email: kcharya@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: https://www.iitk.ac.in/new/dr-krishnacharya	
Short Bio: Dr Krishnacharya is currently working as an Associate Professor in the Department of Physics at the Indian Institute of Technology Kanpur. Before joining IIT Kanpur, he worked at a postdoctoral researcher in an Ivy League institution, University of Pennsylvania, Philadelphia, USA, from 2007 to 2009. He received his Doctor of Philosophy degree from the Max-Planck Institute, Goettingen, Germany, in September 2007. He earned his Master of Technology degree in Solid State Materials from the Indian Institute of Technology Delhi and Master of Science degree in Physics from the Banaras Hindu University, Varanasi, in 2003 and 2000, respectively. His primary research interest is in the area of Soft Matter Physics, in which he has about 15 years of experience. He has been actively working on various phenomena of soft matter such as wetting, microfluidics, lubrication, adhesion, friction. He has received various funding from government funding agencies as well as private industries. Dr. Gupta has authors about 30 research publications and five patents.	
Research Interest Keywords: Soft matter; wetting; microfluidics; adhesion; friction; lubrication	
Summary of Research Interests: Research group of Dr Krishnacharya is actively working on various aspects of liquid-solid and liquid-liquid interfaces, from fundamentals to applications. In addition, his group is also working on the mechanical properties of soft materials such as adhesion and friction of pure and reinforced soft materials.	
Smart City Themes of Interest: Infrastructure and Technology; Mobility and Transport; Energy, Waste and Water	
Related Publications: <ol style="list-style-type: none"> 1. S. Yang, Krishnacharya and P.-C. Lin "Harnessing surface wrinkle patterns in soft matter" Advanced Functional Materials 20, 2550 (2010) 2. S. Vajpayee, Krishnacharya, S. Yang, C.-Y. Hui and A. Jagota "Adhesion selectivity using rippled surfaces" Advanced Functional Materials 21, 547 (2011) 3. J. Barman, D. Swain, B. M. Law, R. Seemann, S. Herminghaus and Krishnacharya "Electrowetting Actuated Microfluidic Transport in Surface Grooves with Triangular Cross Section" Langmuir 31, 1231 (2015) 4. P. K. Roy, R. Pant, A. K. Nagarajan and Krishnacharya "Mechanically Tunable Slippery Behavior on Soft Poly(dimethylsiloxane)-Based Anisotropic Wrinkles Infused with Lubricating Fluid" Langmuir, 32, 5738 (2016) 5. M. Sharma, S. S. Mondal, P. K. Roy and Krishnacharya "Evaporation Dynamics of Pure and Binary Mixture Drops on Dry and Lubricant Coated Slippery Surfaces" Journal of Colloid and Interface Science 569, 244 (2020) 6. M. Sharma, P. K. Roy, J. Barman and Krishnacharya "Mobility of Aqueous and Binary Mixture Drops on Lubricating Fluid Coated Slippery Surfaces" Langmuir 35, 7672, (2019) 7. M. Sharma, P. K. Roy, R. Pant and Krishnacharya "Sink dynamics of aqueous drops on lubricating fluid coated hydrophilic surfaces" Colloids and Surfaces A, 562, 377 (2019) 8. S. K. Ujjain, P. K. Roy, S. Kumar, S. Singha, A. K. Nagarajan and Krishnacharya "Uniting Superhydrophobic, Superoleophobic and Lubricating Fluid Infused Slippery Behavior on Copper Oxide Nano-structured Substrates" Scientific Reports 6, 35524 (2016) 9. C. Jin, Krishnacharya, S. Vajpayee, S. Yang, A. Jagota and C.-Y. Hui "Adhesive contact between a rippled elastic surface and a rigid spherical indenter: from partial to full contact" Soft Matter 7, 10728 (2011) 10. Krishnacharya, J. Zhou and S. Yang "Tunable open-channel microfluidics on soft poly(dimethylsiloxane) (PDMS) substrates with sinusoidal grooves" Langmuir 25, 12794 (2009) 	
Related Grants: <ol style="list-style-type: none"> 1. DST Core Research Grant (CRG) on " Investigation of Wetting Behavior and Mobility of Aqueous Drops on Lubricating Fluid Coated Slippery Surfaces" (Nov'19, for 3 years) (64 lakhs) 2. Bharat Heavy Electricals Limited consultancy project "Feasibility study on the development of hydrophobic coating materials for minimization of steam turbine blade erosion due to droplet impact" (Feb'16, for 3 years) (25 lakhs) 3. Hindustan Unilever Limited consultancy project "Lubricating fluid infused slippery surfaces" (Feb'14, for 4 years) (50 lakhs) 4. TATA Steel consultancy project "Stable superhydrophobic coating on steel surfaces for corrosion prevention and water drag reduction" (Oct'13, for 2 years) (20 lakhs) 5. DST Nano-mission research grant "Fabrication of responsive surfaces with tunable nano-roughness and study of wetting transitions" (June'11, for 5 years) (50 lakhs), 6. DST Fast Track Young Scientist Award "Investigation of slip-length of Newtonian fluids from dewetting dynamics in triangular grooves" (Dec'10, for 3 years) (23 lakhs) 7. DAE Young Scientist Research Award (YSRA) (BRNS) on "Fabrication of tunable wetting surfaces based on responsive polymers" (Sep'10, for 3 years) (17 lakhs) 	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Murali Prasad Panta	Position: Professor of Economics, Economics Sciences (Teaching, Research, Outreach and Administrative activities)
Email: pmprasad@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: http://iitk.ac.in/new/p-murali-prasad	
Short Bio: Dr Murali Prasad Panta holds PhD in Economics and is currently Professor in the Department of Economic Sciences at Indian Institute of Technology Kanpur. He works in the areas of Law and Economics and Environmental Economics. He conducts evidence-based, policy oriented, interdisciplinary research to understand “the impact of human empowerment” on Consumerism and environmentalism. He tries to identify opportunities and design incentives for economic agents to change human behavior to enhance sustainable development from the perspective of: Consumer, Producer, and Citizens well-being. He applies methods of: liability vs regulation theoretical model, technical and cost analysis, and missing market methods and building block methodology. He has published a few papers and books on consumerism and environmentalism in India. He has developed and offered courses on Law and Economics and Environmental Economics and played a crucial role in the M.Sc., Economics Integrated (Five years) Program at the IIT Kanpur. He contributes to law and economics in India by organizing short-term courses under Global Initiative of Academic Networks and Quality Improvement Program, international conferences and the formation of the Indian Association of Law and Economics (IALE). He is the founder President of the IALE. Presently, he works in the areas of- Sustainable Development Cities; Road Safety and Security; and, Healthcare Services.	
Research Interest Keywords: Consumer protection, Environmental protection, Health care services, Water resources, Zoning policy, Road Safety and Security, Institutions, Sustainable development cities, Blue economy,	
Summary of Research Interests: Interdisciplinary (Law and Economics; Environmental Economics) and comparative (Developing and Developed Nations) policy (Rules and Regulations) oriented evidenced (Techno-economic) based research. Sustainable Development Cities; Road Safety and Security; Healthcare Services: and Blue Economy within the ambit of Environmentalism and Consumerism.	
Smart City Themes of Interest: Economic Development; Mobility and Transport; Health and Well being; Security and Safety; Energy, Waste and Water	
Related Publications: Panta Murali Prasad and Manoj Dalvi, Credence Services: The Role of Liability System in India, Artha Vijnana, Vol. 62, No. 1, pp. 62-74.; Naveen Bali, Panta Murali Prasad, and Manal Antelo., Sustainable performance-oriented production practices in Indian iron and steel industry: An empirical investigation, Journal of Cleaner Production, 226, pp. 379-391.; Prasad Panta, et al., The impact of groundwater contamination on households expenditure: The Indian metropolitan cities, Water Utility Journal, Issue 18, pp. 39-50.; P M Prasad, “E-Flows in the Ganga River: A case Study of Tourism”, Journal of Administrative Reforms, Department of Administrative Reforms & Public Grievances, Gol, pp. 19-33. "Environmental Protection: The Role of Regulatory System in India", Economic and Political Weekly, Vol. 41, Number 13, April 1, 1278-1288.; "Environmental Protection: The Role of Liability System in India", Economic and Political Weekly, Vol. 39, Number 3, January 17-23, 257-269.; "The relative efficiency of Liability vs. Regulation in providing incentives to the tortfeasor" Journal of the Indian Law Institute, Vol. 41, Numbers 3&4, pp.405-428.; Panta Murali Prasad, and Ranita Nagar, Ed., Law and Economics: Markets, Non-markets and Network Transactions, Vernon Press, Spain, 2019; Business, Consumer and Government: Economic and Legal Perspectives (India and Germany), New Delhi, Mittal Publications, 2001; Ranita Nagar, Prasad P M, and Pavan Mamidi, Ed., Breaking New Ground: Dispatches on Law and Economics, Eastern Book Company (EBC), India, 2016	
Related Grants: The Socio-economic costs of Road Crashes in India-Evaluation of the Role of Ex-ante and Ex-post Policies, Scheme for Promotion of Academic and Research Collaboration (SPARC), Rs. 36.27 Lakhs, (2019-2021); EVs & HVs vs FFVs: Customer Needs, Wants & Challenges, Maruti Suzuki India Limited (MSIL), Rs. 41 Lakhs, (2017-2018); Ganga River Basin Management Plan (GRBMP)- Themes on “Socio, Economic and Cultural Aspects of Ministry of Environment and Forests (MoEF), Government of India, Rs. 24 Lakhs, (2010-12); Sustainable Flows in River Ganga,WWF-India, Rs. 7.87 Lakhs, (2009-10); Zoning Policy in Indian Mega Cities, ICSSR, New Delhi, Rs. 6.57, (2008-10); Market Failure & Environmental Protection: The Role of Alternative Legal Systems in India, (Under EMCaB programme), Rs. 5 lakhs, (2000-01);	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Nihar Ranjan Patra	Position: Professor, Civil Engineering
Email: nrpatra@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: http://home.iitk.ac.in/~nrpatra/	
Short Bio: <p>I have been involved in various research projects such as Uplift behavior of instrumented Piles and Pile groups under stage compressive loading, Effect of depth of embedment on compressive and pull out capacity of scaled footings in sand, Performance of Retaining Wall with Reinforced granular and Fly ash back fill, Evaluation of Liquefaction Potential of Fly Ash dykes, Study of cyclic and liquefaction potential of alluvial soils along Indo-Gangetic plains.</p> <p>In India, the cities and towns in Indo-Gangetic plains are within a distance of 300 km from the identified seismic gaps in the great Himalayan ruptures which has high potential for future earthquakes. With large overburden of alluvial deposits in these areas, it becomes necessary to study the liquefaction. It includes development of a model for dynamic deformation characteristics of soils from north India considering soil strain.</p> <p>The increase in construction material and the scarcity of raw material initiated the researchers and planners working to find waste material or substitute material which are environmentally friendly and economically sustainable. The static and dynamic properties of stabilized soil by using waste materials and its application to problems like road pavement and railway embankment have attracted wide attention.</p> <p>Fiber Reinforced Polymer is a composite material consisting primarily of two materials, fibers and a resin matrix. FRP has the advantages such as (i) High resistance to fatigue and corrosion</p>	
Research Interest Keywords: Sustainable Geotechnics, Pile Foundation, Soil Arching, Reinforced Earth Structures, Soil Liquefaction	
Summary of Research Interests: Sustainable Geotechnics	
Smart City Themes of Interest: Infrastructure and Technology; Economic Development; Energy, Waste and Water	
Related Publications: <p>Goel, S. and Patra, N. R. (2008) "Effect of Arching on Active earth pressure for Rigid Retaining Walls Considering Translation Mode", International Journal of Geomechanics, ASCE, Vol. 8 (2), pp. 123-133., Citation: Google scholar (103); (9) Shelke, A. and Patra, N. R. (2008) "Effect of Arching on Uplift Capacity of Pile Groups in sand", International Journal of Geomechanics, ASCE, Vol. 8 (6), pp. 347-354. Citation: Google scholar (43); Jishnu R. B, Naik, S. P., Patra, N. R. and Malik, J. N. (2013) "Ground Response Analysis of Kanpur Soil along Indo-Gangetic Plains, Soil Dynamics and Earthquake Engineering, Elsevier, U. K, 51, 47-57. Citation: Google scholar (19); Ashango, A.A., and Patra, N.R. (2014) "Static and cyclic properties of expansive soil stabilized with rice husk ash and Portland slag cement." International Journal of Pavement Engineering, Taylor and Francis, 3, 1-11. Citation: Google scholar (25); Mohanty, S., and Patra, N. R. (2014) "Cyclic Behavior and Liquefaction Potential of Indian Pond Ash Located in Seismic Zone III and IV," Journal of Materials in Civil Engineering, ASCE, 7, 1-5. Citation: Google scholar (19); Nanda, S and Patra, N. R. (2014) "Theoretical Load Transfer curves along piles considering soil non-linearity.", Journal of Geotechnical and Geoenvironmental Engineering, ASCE, 140(1), 91-101. Citation: Google scholar (18); Mohanty, S and Patra, N. R. (2016) "Liquefaction and Earthquake Response Analysis of Panipat Pond ash Embankment in India, Journal of Earthquake and Tsunami., World Scientific Publishing, Singapore, 10(4), 1650009-1-23. Citation: Google scholar (09); Naik, S. P. and Patra, N. R. (2018) "Generation of liquefaction potential map for Kanpur city and Allahabad city of Northern India: an attempt for liquefaction hazard assessment", Geotechnical and Geological Engineering, An International Journal, Springer I; (1) Mishra, A. and Patra, N. R. (2018) "Time-dependent settlement of pile foundations using five-parameter viscoelastic soil models.", International Journal of Geomechanics, ASCE, 18(5), pp 04018020-1-16. Citation: Google scholar (04)</p>	
Related Grants: <p>Effect of Compressive load on uplift capacity of piles/pile groups in marine clay, DST((2005-2009), 10.2 lakhs; Liquefaction potential evaluation and Design of flyash dyke, CSIR (2006-2010), 15 lakhs</p> <p>; Evaluation of Liquefaction Potential of Fly ash Dyke along Indo-Gangetic plains, DST (2008-2012), 29 lakhs</p> <p>; Evaluation of Liquefaction Potential of Alluvial soil along Indo-Gangetic plains, DST (2010-2013), 29 lakhs</p> <p>; Ground Response Analysis of Soils from North India Considering Soil Strain, BRNS (2013-2016), 57 lakhs</p> <p>; Field validation of stabilized material for subgrade pavement, PAAB((2017-2020), 15 lakhs; An Experimental and Numerical Assessment Of Indian Crushable Sands Under Cyclic Loading, CSIR(2017-2020), 23 lakhs; A study of time effects on behavior of Pile-raft foundations, BRNS(2018-2021), 62.8 lakhs</p>	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Pradip Swarnakar	Position: Associate Professor in Sociology, Humanities and Social Sciences
Email: spradip@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: https://www.iitk.ac.in/new/pradip-swarnakar	
Short Bio: Dr Swarnakar is trained as environmental sociologist specialized in climate change adaptation and policy, social network analysis and sustainability transition. He is an administrative board member of an international project group "Climate Change Policy Network (www.compon.org)" which deals with the climate policy of 20 countries. As an expert of social and discourse network analyst, he is instrumental in policy network data analysis of India, Finland, USA, Brazil and Australia. He has been a visiting scholar at the Climate Justice Research Centre, University of Technology Sydney, Australia, Department of Environmental Studies, University of San Francisco, USA, the Department of Social Research, University of Helsinki, Finland, and the Department of Urban and Environmental Sociology, Helmholtz Centre for Environmental Research GmbH-UFZ, Germany. He has been awarded prestigious Fulbright fellowship to study "Sociocultural dimension of drought management in the era of climate change: Lessons learned from California."	
Research Interest Keywords: Environmental Sociology; Climate Change Policy; Social Network Analysis ; Urban Sociology; Computational Sociology; Sustainable Transition; Energy Transition; Sustainability; Technology and Society	
Summary of Research Interests: I am interested in environment and sustainable development related projects, Urban Sustainability, Environmental Sociology, Climate Change Policy, Social Media, Social Networks, Sustainability Transition, Sustainable Water Management	
Smart City Themes of Interest: Economic Development; Urban Planning; Governance and Security; Cultural Heritage; Energy, Waste and Water	
Related Publications: <ol style="list-style-type: none"> Swarnakar, P., Zavestoski, S. and Pattnaik, B.K. (2017). Bottom-up Approaches in Governance and Adaptation for Sustainable Development: Case Studies from India and Bangladesh. New Delhi, India: SAGE Publications. Kumar, A., Mallick, S., & Swarnakar, P. (2020). Mapping Scientific Collaboration: A Bibliometric Study of Rice Crop Research in India, Journal of Scientometric Research, 9(1), 29-39. Kumar, A., Swarnakar, P., Jaishwal, K, Kurele, R (2020). SMIR model for controlling the spread of information in social networking sites, Physica A: Statistical Mechanics and its Applications, 540, 1-14. Kukkonen, A., Ylä-Anttila, T., Swarnakar, P., Broadbent, J., Lahsen, M., & Stoddart, M. C. (2018). International organizations, advocacy coalitions, and domestication of global norms: Debates on climate change in Canada, the US, Brazil, and India. Environmental Science & Policy, 81, 54-62. Ylä-Anttila, T., & Swarnakar, P. (2017) Crowding-in: How and why Indian civil society organizations mobilized on climate change. British Journal of Sociology, 68(2), 273-292. Broadbent, J, Sonnett, J. (...), Swarnakar, P (...), Zhengyi, S. & Hasegawa, K. (2016) Conflicting Climate Change Frames in World Society, Socius: Sociological Research for a Dynamic World. DOI: https://doi.org/10.1177/2378023116670660 Swarnakar, P., Kumar, A., Tyagi, H. (2017) Network Dynamics in Friend Recommendation: A Study of Indian Engineering Students. International Journal of Information Technology and Management, 16(3), 287-300. Swarnakar, P. (2019) Climate Change, Civil Society, and Social Movement in India in India in a Warming World: Integrating Climate Change and Development edited by Navroz Dubash, Oxford University Press, New Delhi. Zavestoski, S. & Swarnakar, P. (2017) Neither 'Top-down' nor 'Bottom-up': A 'Middle-out' Alternative to Sustainable Development in Bottom-up Approaches in Governance and Adaptation for Sustainable Development: Case Studies from India and Bangladesh edited by P. Swarnakar, S. Zavestoski, & B. K. Pattnaik. SAGE Publications, New Delhi. Zavestoski, S. & Swarnakar, P. (2017) Governance for Sustainable Development in the Anthropocene. in Bottom-up Approaches in Governance and Adaptation for Sustainable Development: Case Studies from India and Bangladesh edited by P. Swarnakar, S. Zavestoski, & B. K. Pattnaik. SAGE Publications, New Delhi. 	
Related Grants: <ul style="list-style-type: none"> Principal Investigator of Indo-Australia joint project "Climate Change Policy Network: Exploring Post-Paris Climate Discourse in India and Australia" funded by Indian Institute of Technology Kanpur Initiation Grant and Climate Justice Research Centre, University of Technology Sydney with Prof. James Goodman, University of Technology Sydney, (Indian Budget: Rs. 25,00,000), 2019-22. Principal Investigator of the project "Climate-Energy Policy Network: A Comparative Study of India and Japan" jointly funded by Indian Council of Social Science Research (ICSSR) and Japan Society for the Promotion of Science (JSPS), in collaboration with Prof. Koichi Hasegawa, Tohoku University, Sendai, Japan, (Indian Budget: Rs. 11,82,500), 2019-2021. Principal Investigator of Indian research group of "Climate Change Policy Networks (COMPON)" funded by National Science Foundation, USA. International PI is Professor Jeffery Broadbent, University of Minnesota, USA. (Indian Budget: US\$31,660.00), 2014- 2015. Principal Investigator of the project "Sociology of Social Network Sites: A Social Capital Approach to the Study of Young Adults of India" funded by Indian Council of Social Science Research, Ministry of HRD, Government of India (Budget: Rs. 5,69,750), 2011-2014. 	



Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Pranamesh Chakraborty	Position: Assistant Professor, Civil Engineering
Email: pranames@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: https://www.iitk.ac.in/new/pranamesh-chakraborty	
Short Bio: Dr. Pranamesh Chakraborty is an Assistant Professor in the Civil Engineering department of IIT Kanpur. He did his Ph.D. at Iowa State University where he worked on several research projects for the Iowa Department of Transportation, National Science Foundation, Nebraska Department of Roads, and Toyota Collaborative Safety Research Center. He received his M. Tech in Civil Engineering from IIT Kanpur and B.E. in Civil Engineering from Bengal Engineering and Science University, Shibpur (presently, IEST Shibpur).	
Research Interest Keywords: Big Data Analytics, Machine Learning, Computer Vision, Intelligent Transportation Systems, Deep Learning	
Summary of Research Interests: My research focusses on applying deep-learning based computer vision techniques and large-scale data analytics for solving transportation engineering problems.	
Smart City Themes of Interest: Mobility and Transport; Governance and Security; Security and Safety	
Related Publications: P. Chakraborty, C. Hegde, and A. Sharma. Data-driven parallelizable traffic incident detection using spatio-temporally denoised robust thresholds. Transportation Research-Part C, vol. 105, p81-99, August 2019. https://doi.org/10.1016/j.trc.2019.05.034 ; P. Chakraborty, Y.O. Adu-Gyamfi, S. Poddar, V. Ahsani, A. Sharma, and S Sarkar. Traffic Congestion Detection from Camera Images using Deep Convolution Neural Networks. Transportation Research Record: Journal of the Transportation Research Board, vol. 2672, no. 45, p222-231, December 2018. https://doi.org/10.1177/0361198118777631 ; P. Chakraborty, A. Sharma, and C. Hegde. Freeway Traffic Incident Detection from Cameras: A Semi-Supervised Learning Approach, 2018 21st International Conference on Intelligent Transportation Systems (ITSC), pp. 1840-1845., December 2018. doi:10.1109/ITSC; P. Chakraborty and A. Sharma. Public Opinion Analysis of Transportation Policy using Social Media Data: Case Study on the Delhi Odd-Even Policy, Transportation in Developing Economies, vol. 5, March 2019. https://doi.org/10.1007/s40890-019-0074-8 ; P Chakraborty, J.R. Hess, A. Sharma, and S. Knickerbocker. Outlier mining based traffic incident detection using big data analytics, Transportation Research Board 96th Annual Meeting, January 2017.; M. Amin-Naseri, P. Chakraborty, A. Sharma, S.B. Gilbert, and M. Hong. Evaluating the Reliability, Coverage, and Added Value of Crowdsourced Traffic Incident Reports from Waze. Transportation Research Record: Journal of the Transportation Research Board, v	
Related Grants:	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Praveen Kulshreshtha	Position: Professor Economic Sciences
Email: pravk@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: https://www.iitk.ac.in/new/praveen-kulshreshtha	
Short Bio: Dr Praveen Kulshreshtha received his Bachelor and Master degrees in Statistics from Indian Statistical Institute, Kolkata, and M. A. and Ph. D. degrees in Economics from Cornell University, U.S.A. He has held full-time faculty positions at Virginia Tech, U.S.A., Madras School of Economics, Chennai, Indian Institute of Management, Ahmedabad, Indira Gandhi Institute of Development Research, Mumbai, and Indian Institute of Technology Roorkee. He is currently Professor of Economics at Indian Institute of Technology Kanpur. His interests span Microeconomics, Industrial Economics, Governance and Ethics.	
Research Interest Keywords: Microeconomics; Industrial Economics; Governance; Ethics; Corruption; Business Ethics	
Summary of Research Interests: His research interests span Microeconomics, Industrial Economics, Governance and Ethics.	
Smart City Themes of Interest: Economic Development; Health and Well being; Governance and Security; Security and Safety	
Related Publications: <ol style="list-style-type: none"> 1. "Ethical Leadership and Contemporary Organizational Ethics: Principles and Cases", Journal of Leadership, Accountability and Ethics (North American Business Press, U.S.A.), Vol. 12, No. 1, February, 2015, pp. 94-97. 2. "Public Sector Governance Reform: The World Bank's Framework", International Journal of Public Sector Management (Emerald Publishers, U. K.), Vol. 21, No. 5, August, 2008, pp. 556-567 3. "An Efficiency and Welfare Classification of Rationing by Waiting in the Presence of Bribery", Journal of Development Economics (Elsevier Science Publishing, New York, U.S.A.), Vol. 83, No. 2, July, 2007, pp. 530-548. 4. "Business Ethics Versus Economic Incentives: Contemporary Issues and Dilemmas", Journal of Business Ethics (Springer Publishers, Netherlands), Vol. 60, No. 4, September, 2005, pp. 393-410. 5. "Efficiency Analysis of Coal-based Thermal Power Generation in India during Post-Reform Era" (Co-author: Dr. K.R. Shanmugam, M.S.E., Chennai, India), International Journal of Global Energy Issues (Inderscience Publishers, Switzerland), Vol. 23, No. 1, January, 2005, pp. 15-28. 6. "Rationing by Waiting, Opportunity Costs of Waiting and Bribery", Indian Economic Review (Delhi School of Economics, Delhi, India), Vol. XXXVIII, No. 1, January – June, 2003, pp. 59-75. 7. "No return, No refund: An Analysis of Deposit-Refund Systems" (Co-author: Sudipta Sarangi, Louisiana State University, U.S.A.), Journal of Economic Behavior and Organization (Elsevier Science Publishing, New York, U.S.A.), Vol. 46, Issue 4, December, 2001, pp. 379-394. 8. "Efficiency of Indian Microfinance Institutions: A Data Envelopment Analysis" (Co-author: Muneer Babu M., Ph.D. Research Scholar, I.I.T. Kanpur), Indian Economic Journal (Indian Economic Association), Vol. 60, No. 4, January-March, 2013. 9. "Productivity Change and Technical Efficiency in Indian Microfinance Institutions" (Co-author: Muneer Babu M., Ph.D. Research Scholar, I.I.T. Kanpur), Studies in Microeconomics (Sage Publications, India), Vol. 2, No. 2, December, 2014, pp. 165-200. 10. "Efficiency of Thermal Power Plants in India" (Co-author: Dr. K.R. Shanmugam, M.S.E., Chennai, India), Vikalpa: The Journal for Decision Makers (I.I.M., Ahmedabad, India), Vol. 27, No. 4, September – December, 2002, pp. 57-68. 	
Related Grants: The Socio-economic Costs of Road Crashes in India - Evaluation of the Role of Ex-ante and Ex-post Policies (# 1442), Scheme for Promotion of Academic and Research Collaboration (SPARC), Ministry of Human Resource Development, Government of India, Rs. 36.27 Lakhs, 2 years	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Prishati Raychowdhury	Position: Associate Professor, Department of Civil Engineering
Email: prishati@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: http://home.iitk.ac.in/~prishati/	
Short Bio: Dr. Prishati Raychowdhury had joined the department of Civil Engineering, Indian Institute of Technology Kanpur (IITK) in September 2009. Prior to joining IITK, she was working as a geotechnical engineer in the Earth Mechanics, Inc. in California, USA. She has received her Doctor of Philosophy degree from the University of California at San Diego, Master of Technology degree from the Indian Institute of Technology Kanpur (IITK), and Bachelor of Engineering degree from Bengal Engineering College, currently known as Indian Institute of Engineering Science and Technology (IIEST), all majored in civil engineering. Her research areas of interest are soil dynamics, geotechnical earthquake engineering, seismic soil-structure interaction, liquefaction analysis. She has published several research articles in reputed international journals; supervised 2 PhD students; and more than 20 MTech students till date.	
Research Interest Keywords: Soil dynamics, Geotechnical earthquake engineering, soil-structure interaction	
Summary of Research Interests: My primary research focus is on seismic behavior of rocking shallow foundations, soil-foundation interface modeling and effect of soil-structure interaction on seismic response of various structures. The outcomes of my research have indicated the possibility of utilizing the energy dissipative capability of rocking shallow foundations towards more economic design of structures while reducing the overall vulnerability.	
Smart City Themes of Interest: Infrastructure and Technology; Urban Planning	
Related Publications: Vivek, B. and Raychowdhury, P. (2019). "Design and calibration of a laminar soil box suitable for a low-capacity shake table using free-field tests on Ganga sand", Soils and Foundations, DOI: https://doi.org/10.1016/j.sandf.2019.03.010 ; Kumawat, A., Raychowdhury, P. and Chandra, S. (2019). Frequency-dependent analytical model for ballasted rail track systems subjected to moving load, International Journal of Geomechanics (ASCE). Vol. 19, No. 4, pp. 04019016.; Vijayasri, T., Raychowdhury, P., and Patra, N. R. (2018). "Dynamic Behavior of a Geotextile-Reinforced Pond Ash Embankment", Journal of Earthquake Engineering (Taylor and Francis), DOI: https://doi.org/10.1080/13632469.2018.1483848 ; Vivek, B. and Raychowdhury, P. (2017). "Influence of SSI on period and damping of buildings supported by shallow foundations on cohesionless soil", International Journal of Geomechanics (ASCE), Vol. 17, No. 8, pp. 04017030-1.; Vivek, B., Sharma, S., Raychowdhury, P. and Ray-chaudhuri S. (2017). "Study on Failure Mechanism of Self-supported Electric Poles through Full-scale Field Testing", Engineering Failure Analysis (Elsevier), Vol. 77, pp. 102-117.	
Related Grants:	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Priyanka Ghosh	Position: Civil (Geotechnical) Engineer, Department of Civil Engineering
Email: priyog@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: http://home.iitk.ac.in/~priyog/	
Short Bio: Dr. Priyanka Ghosh is a Professor in the Department of Civil Engineering, IIT Kanpur. After completion of PhD from IISc, Bangalore in 2005, he served as faculty member at BITS, Pilani, IIT Kharagpur and IIT Kanpur. His primary research focus is in Computational and Experimental Geomechanics and in particular, analysis of foundations, ground anchors, retaining structures, vibration isolation and geopolymers. He is the recipient of several awards like "IEI Young Engineers Award" by The Institute of Engineers (India), "Outstanding Young Investigator Award" by International Association for Computer Methods and Advances in Geomechanics (IACMAG), USA, "Scholarship for Young Indian Researchers" by the Italian Ministry of Education, University and Research, "Indo-US Research Fellowship" by Indo-US S&T Forum, "Class of 1982 Research Fellowship" by IIT Kanpur etc. He has published several research papers in various international journals and conferences. He has guided several post graduate students for their thesis work and taught different courses at various capacities. He is associated with a number of sponsored research projects funded by different government organization such as Dept. of Science and Technology (DST), India; CSIR, India, Research Design and Standards Organisation (RDSO), Indian Railway, India etc.	
Research Interest Keywords: Foundation engineering, Retaining structures, Ground anchors, Slope stability, Geotechnical earthquake engineering	
Summary of Research Interests: <ul style="list-style-type: none"> Bearing capacity of foundations under both static and seismic cases Method of characteristics Upper bound limit analysis Finite element analysis Pullout resistance of anchors and piles Stability of retaining walls under both static and seismic cases Slope stability 	
Smart City Themes of Interest: Infrastructure and Technology	
Related Publications: <ol style="list-style-type: none"> Kumar, M. R. and Ghosh, P. "A novel vibration screening technique using bamboo – a numerical study". Journal of Natural Fibers, (accepted).; Ghosh P., Shrivastava R. and Swain A. (2019) "Geotechnical stability assessment of more than 100-year old railway arch bridge – a case study". Sadhana - Academic Proceedings in Engineering Sciences (Springer), Vol. 44, No. 9, pp 191(1-13).; Biswas, N. and Ghosh, P. (2018) "Interaction of adjacent strip footings on reinforced soil using upper-bound limit analysis". Geosynthetics International, Vol. 25, No. 6, pp 599-611.; Santhoshkumar, G. and Ghosh, P. (2018) "Seismic passive earth pressure on an inclined cantilever retaining wall using method of stress characteristics - a new approach". Soil Dynamics and Earthquake Engineering, Vol. 107, pp 77-82.; Majumder, M., Ghosh, P. and Rajesh, S. (2017) "An innovative vibration barrier by intermittent geofoam - A numerical study". Geomechanics and Engineering, An International Journal, Vol. 13, No. 2, pp 269-284.; Sarangi, P. and Ghosh, P. (2016) "Seismic analysis of nailed vertical excavation using pseudo-dynamic approach". Earthquake Engineering and Engineering Vibration, Vol. 15, No. 4, pp 621-631.; Surapreddi, S., Ghosh, P. and Biswas, K. (2018) "Pond ash-kaolinite-fiber based geopolymers: processing and strength assessment". Proceedings of the Institution of Civil Engineers - Waste and Resource Management, Vol. 171, No. 3, pp 62-70.; Santhoshkumar, G., Ghosh, P. and Murakami, A. (2019) "Seismic active resistance of a tilted cantilever retaining wall considering adaptive failure mechanism". International Journal of Geomechanics (ASCE), Vol. 19, No. 8, pp 04019086.; Swain, A. and Ghosh, P. (2019) "Determination of visco-elastic properties of soil and prediction of static and dynamic response". International Journal of Geomechanics (ASCE), Vol. 19, No. 7, pp 04019072. 	
Related Grants: <ul style="list-style-type: none"> "Investigation on Seismic Response of Two Closely Placed Shallow Ground Anchors", funded by Department of Science and Technology (DST), Govt. of India, Rs. 19,50,000.; "Investigation of Dynamic Interference Effect of Two nearby Shallow Foundations", funded by Department of Science and Technology (DST), Govt. of India, Rs. 13,38,000.; "Seismic Analysis of Different Geotechnical Structures", funded by IIT Kanpur, India (initiation grant), Rs. 10,00,000. 	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Purushottam Kar	Position: Assistant Professor, Department of Computer Science and Engineering
Email: purushot@cse.iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: https://www.cse.iitk.ac.in/users/purushot/	
Short Bio: I am currently working at the Department of Computer Science and Engineering, IIT Kanpur as an assistant professor. I work in the areas of optimization, including online and stochastic optimization techniques, and non convex optimization, statistical learning theory, high dimensional statistics, as well as applications to machine learning problems such as kernel methods and extreme multi-label learning.	
Research Interest Keywords: Machine Learning, Optimization, Robust Statistics, AI in Education, Air Quality Monitoring	
Summary of Research Interests: I work in the areas of optimization, including online and stochastic optimization techniques, and non convex optimization, statistical learning theory, high dimensional statistics, as well as applications to machine learning problems such as kernel methods and extreme multi-label learning.	
Smart City Themes of Interest: Infrastructure and Technology; Economic Development; Health and Well being; Urban Planning	
Related Publications:	
Related Grants:	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Raghu Nandan Sengupta	Position: Head and Professor, Industrial & Management Engineering
Email: raghus@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: https://www.iitk.ac.in/new/raghu-nandan-sengupta	
Short Bio: With my background in probability, statistics and optimization (with a focus for application in finance and other areas) I am certain to contribute substantially in areas related to stochastic, big data analysis, stochastic and robust optimization, statistical inference, sequential analysis, quantitative finance, etc. With my fourteen years of research and teaching experience in one of the best technical institutes in Asia, plus frequent research visits and teaching assignments at University of Warszawa, POLAND, IST, Lisboa, PORTUGAL, TU Dresden, GERMANY, Bilkent University, TURKEY, MUST, IRAN, etc., has helped me tremendously to built expertise in both theoretical as well as applied areas of sequential analysis, robust and reliability based optimization, statistical reliability, quantitative finance. I am confident of my capability and am certain that my contribution in this respect would be a worthwhile effort from my side which will accrue tangible benefit to both my parent institute as well to my host organization along with a great academic research exposure for me.	
Research Interest Keywords: Big Data Analytics, Optimization, Estimations, Regression, Operations Research	
Summary of Research Interests: 01) Sequential Estimation. 02) Statistical Estimation. 03) Statistical and Mathematical Reliability. 04) Optimization Techniques and their Applications Finance. 05) Financial Risk Analysis.	
Smart City Themes of Interest: Economic Development; Health and Well being; Urban Planning; Governance and Security; Food Security and Agriculture; Energy, Waste and Water	
Related Publications: Information sharing in a serial supply chain of low demand item: Sunil Agrawal, Raghu Nandan Sengupta and Kripa Shanker, Vision 2020: The Strategic Role of Operational Research, (Edited N. Ravichandran), Chapter 20, 332-347, 2006, Allied Publishing Compan; Bankruptcy Prediction Using Artificial Immune Systems: Rohit Singh and Raghu Nandan Sengupta, Lecture Notes in Computer Science (Book: Artificial Immune Systems), (Edited L.N. de Castro, F.J.Zuben and H.Knidel), 4628, 131-141, 2007, Springer-Verlag, ISBN: 978-3-540-73921-0; Decision Sciences: Theory and Practice*: Raghu Nandan Sengupta, Aparna Gupta and Joydeep Dutta (Edited), 2016, CRC Taylor & Francis, ISBN (10): 146656430X; ISBN (13): 9781466564305; LINEX Loss Function and its Statistical Application – A Review: Saibal Chattopadhyay, Ajit. Chaturvedi and Raghu Nandan Sengupta, Decision, Jan – Dec 1999, 26, 1-4, 51-76; Sequential Estimation of a Linear Function of Normal Means Under Asymmetric Loss Function: Saibal Chattopadhyay, Ajit Chaturvedi and Raghu Nandan Sengupta, Metrika, 2000, 52, 3, 225-235; Asymmetric Penalized Prediction Using Adaptive Sampling Procedures: Saibal Chattopadhyay, Sujay Datta and Raghu Nandan Sengupta, Sequential Analysis, 2005, 24, 1, 23-43; Use of Asymmetric Loss Functions in Sequential Estimation Problem for the Multiple Linear Regression: Raghu Nandan Sengupta, Journal of Applied Statistics, 2008, 35, 3, 245-261; Impact of information sharing and lead time on bullwhip effect and on-hand inventory: Sunil Agrawal, Raghu Nandan Sengupta and Kripa Shanker, European Journal of Operational Research, 2009, 192, 576-593; Some variants of adaptive sampling procedures and their applications: Raghu Nandan Sengupta and Angana Sengupta, Computational Statistics and Data Analysis, 2011, 55, 3183-3196	
Related Grants:	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Rajesh Sathiyamoorthy	Position: Associate Professor, Civil Engineering
Email: hsrajesh@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: http://home.iitk.ac.in/~hsrajesh/	
Short Bio: Dr. Rajesh Sathiyamoorthy is an Associate Professor in the Department of Civil Engineering, Indian Institute of Technology Kanpur, India. He obtained his Ph.D. in Geotechnical Engineering from Indian Institute of Technology Bombay, M.Tech from Anna University, Guindy campus, and B.Tech from University of Madras. He worked as a Post-Doctoral research fellow at LTHE, Grenoble, France for one year. His research interest includes Geosynthetics, Geo-environmental issues, Numerical and Physical modelling of geostructures. He has graduated one Ph.D. and 23 M.Tech. students and currently mentoring 6 Ph.D. and 3 M.Tech. students. He has published more than 80 technical papers in journals and conferences. He is associated with several research and consultancy projects and involved in few international collaborative projects. He has received IEI Young Engineers Award (Civil Engineering) from The Institution of Engineers (India), Distinguished Alumni Award (Academic and Research) from VIT university, and Talented Young Scientist Award from Ministry of Science and Technology (China). He is also a recipient of IGS - Prof. A.V. Shroff Biannual Award, Prof. G. A. Leonards Biannual Award, International Geosynthetic Society Student Award, IITK Best Instructor Award (six times) and few best paper awards. He is a member of TC-106 (Unsaturated Soils) ISSMGE, Editorial board Environmental Geotechnics Journal (2016-18), ASCE, IEI, IGS, ISTE and ISG.	
Research Interest Keywords: Geotechnical Health Monitoring, Centrifuge and numerical modelling, Geoenvironmental issues and challenges, Engineered landfills, Unsaturated soil behaviour, Geosynthetics, Ground Improvement Techniques, Pond ash embankment stability, Vibration screening, Expansive soils	
Summary of Research Interests: Compacted soils are commonly encountered in several infrastructural projects. Climate variations and associated changes in the unsaturation of compacted soils could alter engineering properties which can pose substantial threats and create detrimental effects. Our research team engages in understanding the deformation behaviour of compacted soils under various geoenvironmental conditions. We also work on exploring alternative materials for compacted soils like geocomposite materials.	
Smart City Themes of Interest: Infrastructure and Technology; Urban Planning; Energy, Waste and Water	
Related Publications: Roy, S. and Rajesh, S. 2020. The coupled effect of suction and net stress on the air permeability of compacted soils. Geotechnique Letters, ICE Publishers, 10(1), 1-7; Pandey, B.K., and Rajesh, S. 2019. Enhanced engineering characteristics of soils by electro-osmotic treatment: An overview. Geotechnical and Geological Engineering, Springer, 37(6), 4649-4673.; Ganesh, R., and Rajesh, S. 2019. Analytical solution to estimate the point of application of resultant passive earth thrust against unsaturated retaining structures. Geomechanics and Geoengineering. https://doi.org/10.1080/17486025.2019.1680880 ; Rajesh, S. 2017. Time dependent behaviour of fully and partially penetrated geosynthetic encased stone columns. Geosynthetics International, ICE Publishers, 24(1), 60-71; Rajesh, S., Babel, K., and Mishra, S.K. 2017. Reliability based assessment of municipal solid waste landfill slope. Journal of Hazardous, Toxic, and Radioactive Waste, ASCE, 21(2), 040160161-11; Rajesh, S. and Khan, V. 2018. Characterisation of water sorption and retention behaviour of partially saturated GCLs using vapor equilibrium and filter paper methods, Applied Clay Science, Elsevier, 157, 177-188.; Rajesh, S., Rao, B.H., Sreedeeep, S., Arnepalii, D.N. 2015. Environmental Geotechnology: An Indian Perspective. Environmental Geotechnics, ICE Publishers, 2(6), 336-348; Rajesh, S., Gour., J.P., and Viswanadham, B.V.S. 2014. Evaluation of Gas permeability and Mechanical Behaviour of Soil Barriers of Landfill Cap Covers through Laboratory tests. Applied Clay Science, Elsevier, 97-98, 200-214; Rajesh, S., and Viswanadham, B.V.S. 2012. Modelling and instrumentation of geogrid reinforced soil barriers of landfill covers. Journal of Geotechnical and Geoenvironmental Engineering, ASCE, 138(1), 26-37.	
Related Grants: Studies on settlement and stability of embankments on geosynthetic encased stone column. [Shanghai Council of Science and Technology, SCST China: 2018-2020], PI, [Collaborator: Dr. Jianfeng Chen, Tongji University, China] Grant: RMB 300,000, Duration 2 years.; Hydro-Mechanical behaviour of compacted soils under varied stress state and saturation conditions. [Science and Engineering Research Board, SERB, DST: 2019-2022] PI, Grant: 32.3L. Duration: 3 years; A study of time effects on behaviour of pile-raft foundations [Board of Research in Nuclear Sciences, BRNS: 2018-2021] Co-PI, Grant: 62.05L Duration: 3 years.; Field validation of stabilised material for subgrade pavement. [Project Administrative and Advisory Board – PAAB, MHRD: 2017-2020] Co-PI, Grant: 15L Duration: 3 years.; Hydro-Mechanical behaviour of unsaturated soil barriers of landfill lining system. [Science and Engineering Research Board, SERB, DST, Completed Dec 2016] PI, Grant: 23.3L. Duration: 3 years; Stabilization of railway embankments using micropiles. [Research Design and Standard Organisation, RDSO, Lucknow, Completed Nov 2016] PI, Grant: 6.6L. Duration: 1 year; Development of an experimental facility to evaluate the effectiveness of the hydraulic barrier as a gas barrier layer in the landfill system. [Initiation grant IIT Kanpur, Completed Dec 2013]. Grant: 10L. Duration: 1.5 year	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Raju Kumar Gupta	Position: Associate Professor, Chemical Engineering
Email: guptark@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: https://www.iitk.ac.in/che/rkg.htm linkedin.com/in/raju-kumar-gupta-b184b514	
Short Bio: Dr. Raju Kumar Gupta is currently an associate professor at department of chemical engineering at IIT Kanpur. He joined IIT Kanpur as faculty in 2012 after completing his PhD at National University of Singapore and post-doc at Nanyang Technological University Singapore. He has over 12 years of experience in the area of synthesis of nanostructured materials and their hybrid polymeric composites. He is an active researcher in the area of surface chemistry, photocatalysis, perovskite solar cells, functional polymers and nanocomposites for environmental and energy storage applications. He has done considerable work in the area of sustainable materials, nanostructured photocatalysts for wastewater treatment applications and interface engineering for perovskite solar cell applications. He has supervised 13 M.Tech and 4 PhD students as well as mentored many Postdoctoral fellows. He has been recipient of several fellowships and awards for his outstanding career in academic and research fields. Dr. Gupta is an editorial board member of several international journals, as well as a member of scientific bodies around the globe. Dr. Gupta has authored more than 70 research articles in SCI journals, 3 books, and 10 book chapters. Considering his expertise, he has been recently appointed Associate Editor for the Elsevier journal 'Solar Energy'.	
Research Interest Keywords: Surface chemistry, green synthesis of nanomaterials, photocatalysis, perovskite solar cells, dielectric materials, supercapacitors, emerging contaminants, wastewater treatment, reactor design, nanostructured materials for energy and environmental applications	
Summary of Research Interests: Dr. Gupta's research group 'Energy and Environmental Lab' focuses on the development of nanostructured materials for energy and environmental applications. His research interests include surface chemistry, green synthesis, photocatalysis, emerging contaminants, wastewater treatment, reactor design, hybrid perovskite solar cells, high dielectric constant materials, supercapacitors, functional polymers and nanocomposites for environmental and energy applications.	
Smart City Themes of Interest: Mobility and Transport; Energy, Waste and Water	
Related Publications: https://doi.org/10.1016/j.electacta.2019.135590 ; https://doi.org/10.1016/j.solmat.2019.110130 ; https://doi.org/10.1016/j.solener.2019.07.042 ; DOI: 10.1021/acsami.9b01359; https://doi.org/10.1016/j.jece.2018.102843 ; DOI: 10.1039/C7TA09193A; DOI: 10.1021/acsami.7b07571; DOI: 10.1021/acs.chemrev.5b00495; DOI: 10.1039/C6RA10488F	
Related Grants: 2) Green and low-cost synthesis of quantum dots for solar energy and environmental applications: (35 Lakhs from DST India under INSPIRE faculty award; 2013-2018); 5) Synthesis of polymer nano-composites for energy storage applications: (24 Lakhs from Department of Atomic Energy (DAE), India; 2014-2017); 6) Interface engineering and development of hole-transporting materials for perovskite solar cells: (72.6 Lakhs from DST India; 2016-2019); 7) Carbon bead-supported carbon nanofibers immobilized with photocatalysts for the treatment of the effluent water from pharmaceutical industries: (34.8 Lakhs from DST India; 2016-2019)	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Salil Goel	Position: Assistant Professor, Civil Engineering
Email: sgoel@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: https://in.linkedin.com/in/salil-goel-8513b826	
Short Bio:	
Research Interest Keywords: Intelligent Transport Systems, LiDAR, Mobile Mapping Systems, Sensor fusion, Navigation, GNSS	
Summary of Research Interests: <ul style="list-style-type: none"> • Sensor fusion for positioning, navigation and mapping in challenging and indoor environments <ul style="list-style-type: none"> • Photogrammetry, LiDAR • Cooperative Swarms, Cooperative Localization and Mapping • UAV applications • Filtering and estimation 	
Smart City Themes of Interest: Infrastructure and Technology; Mobility and Transport; Cultural Heritage	
Related Publications: Cooperative Localization of Unmanned Aerial Vehicles Using GNSS, MEMS Inertial, and UWB Sensors; A motion correction technique for laser scanning of moving objects; A Distributed Cooperative UAV Swarm Localization System: Development and Analysis; Cramér Rao Bound Analysis for Cooperative Positioning in Intelligent Transportation Systems; Development and Experimental Evaluation of a Low-Cost Cooperative UAV Localization Network Prototype; Experimental Evaluation of a UWB-Based Cooperative Positioning System for Pedestrians in GNSS-Denied Environment	
Related Grants: Title: Park-IT: Advanced Parking for Indian Traffic Funded by: MHRD, Govt. of India Grant amount: Approx. INR 50 lacs Duration: 2019-2021; Title: PNAV: Cooperative Assisted-Navigation for Pedestrians in Indoor-Outdoor Environments Funded by: IIT Kanpur Grant: INR 25 lacs Duration: 2018-2020	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Santanu Misra	Position: Associate Professor, Department of Earth Sciences
Email: smisra@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: http://home.iitk.ac.in/~smisra/	
Short Bio: <p>Dr. Santanu Misra is a well-known young geologist with remarkable experience from different parts of the globe. His pioneering and substantial research find extensive applications for our understanding of the mechanical behavior of deep-Earth.</p> <p>Santanu showed how deformation affects in producing partial melts in subduction zones and modifies significantly the seismic anisotropy in lower-crust. His approach in solving a research problems consists of three fundamentals of science – theory, experiments and modelling. Being a geoscientist, Santanu meticulously integrated field-observations into these three pillars. Santanu also worked on problems of landslides, fracture and earthquake mechanics. The versatility of his research demonstrates the breadth of his knowledge and the insight he has in the Earth Sciences as a whole.</p> <p>This is also evident from his excellent publication track in reputed journals. His important contributions to Earth Sciences has been recognized by many prestigious awards and fellowships (e.g., INSA Young Scientist Medal, Swiss National and Swarnajayanti Fellowships). Santanu is also an outstanding teacher. In IIT Kanpur, he received outstanding-teacher recognition from the Academic-Senate for 4 times in a row.</p>	
Research Interest Keywords: Surface-Armosphere interaction, Landslide, Earthquake, Land-use map, soil and rock characterization, Urban Planning, CO2 sequestration	
Summary of Research Interests: Geology and mechanics of soil and rocks and its interaction with atmosphere, deep earth and anthropogenic activities.	
Smart City Themes of Interest: Infrastructure and Technology; Urban Planning; Cultural Heritage; Energy, Waste and Water	
Related Publications: <p>Nanda, K.*, Vaishakh, TK, Das, A and MISRA, S. [2020]. Hydro-mechanical response in porous rocks during localized deformation: A finite element analysis. Journal of Structural Geology 130; https://doi.org/10.1016/j.jsg.2019.103909;</p> <p>Mukhopadhyay, M.*, Biswas, U., Mandal, N. and MISRA, S. [2019]. On the development of shear surface roughness. Journal of Geophysical Research-Solid Earth 124; https://doi.org/10.1029/2018JB016677;</p> <p>Mukherjee, M.* and MISRA, S. [2018]. A review of experimental research on Enhanced Coal Bed Methane (ECBM) Recovery via CO2 sequestration. Earth-Science Reviews 179; 392-410. https://doi.org/10.1016/j.earscirev.2018.02.018;</p> <p>MISRA, S., Ellis, S. and Mandal, N. [2015]. Fault damage zones in mechanically layered rocks: the effects of planar anisotropy. Journal of Geophysical Research-Solid Earth 120; https://doi.org/10.1002/2014JB011780;</p> <p>Ghosh, S., Baruah, A., MISRA, S. and Mandal, N. [2015]. Effect of bedrock anisotropy on hill-slope failure in the Darjeeling-Sikkim Himalaya: an insight from physical and numerical models. Landslide 12; 927-941; https://doi.org/10.1007/s10346-014-0513-x;</p> <p>Van Dissen, R.J., McSaveney, M.J., and MISRA, S. [2013]. Landslides and liquefaction generated by the Cook Strait and Lake Grassmere earthquakes: a reconnaissance report. Bulletin of the New Zealand Society for Earthquake Engineering 46(4); 196-200. h; MISRA, S., Mandal, N. and Chakraborty, C. [2009]; Formation of Riedel shear fractures in granular materials: findings from analogue shear experiments and theoretical analyses; Tectonophysics 471; 253-259. https://doi.org/10.1016/j.tecto.2009.02.017;</p> <p>MISRA, S., Mandal, N., Dhar, R. and Chakraborty, C. (2009); Mechanisms of deformation localization at the tips of shear fractures: Findings from analogue experiments and field evidence, Journal of Geophysical Research-Solid Earth 114; https://doi.org/10.1029/2009JB007101;</p> <p>Mandal, N., Mitra, A., MISRA, S., and Chakraborty, C. (2006); Is the outcrop topology of dolerite dikes of the Singhbhum Archean craton fractal in nature? Journal of Earth System Science 115; 643-660. https://doi.org/10.1007/s12040-006-0002-2</p>	
Related Grants: Enhanced CBM recovery and CO2 sequestration - ONGC India - 31744911 INR - 3 years; Seismic-aseismic transitions of active faults in Himalaya - DST India - 4210200 INR - 3 years; Dynamics of subduction interface: from earthquakes to partial melting - DST India - 31185440 - 5 years; Rheology and frictional properties of Wellington Fault - Earthquake Commission (EQC) New Zealand - 45000 NZD - 2 years	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Shantanu Bhattacharya	Position: GVMM Chair and Professor, Department of Mechanical Engineering, Ex Head, Design Program, Department of Mechanical Engineering
Email: bhattacs@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: http://home.iitk.ac.in/~bhattacs/	
Short Bio: Shantanu Bhattacharya is currently a professor at the Department of Mechanical Engineering at the Indian Institute of Technology Kanpur and has served as the Head of Design Program at IIT Kanpur. Prior to this Shantanu has served the IIT system for near about 10 years in various capacities like Assistant and Associate professor. He has done his B. Tech. degree from the Delhi College of Engineering in 1996 in Production and Industrial Engineering after which he served as a Senior Engineer at Maruti Suzuki India Limited upto 2002 in the production division. After this he went to do his Master of Science Degree from Texas Tech University, Lubbock, Texas in Mechanical Engineering. He completed this degree in 1.5 years and also served as a research associate at the Jack Maddox Laboratory. He was made a part of the Chancellor's list and based on his Master's thesis a paper was written by him and published by the Journal of Microelectro-mechanical systems (IEEE-ASME journal) which has around 650 + citations so far. Shantanu also received the Huggins Ellsworth Graduate Fellowship at the University of Missouri at Columbia through which he completed his PhD in Bio Engineering from the same place in 2006. During his PhD he also received a grant of around \$75000 from the national pork board (NPB) through which he developed a biochip for early detection of Porcine reproductive and respiratory syndrome (a disease commonly found within the swine herds of mid-western United States).	
Research Interest Keywords: MEMS, Biosensors, Water Remediation, Printable Energy Storage, Nanotechnology, Acoustic Metamaterials, Micro/ Nano Fabrication	
Summary of Research Interests: I have developed several key technologies through my research in Biosensors, Biomedical Instrumentation Design for resource poor settings, applications of micro/nano fabrication to water, environment and energy research etc. The major highlights are (a) low-cost Dengue detection platform and impedance based RT-PCR platforms for detection (b) Acoustic meta-structures for noise mitigation within aircrafts (c) Printed energy storage solutions (d) Helium sensors (e) water treatment plants etc.	
Smart City Themes of Interest: Health and Well being; Food Security and Agriculture; Energy, Waste and Water	
Related Publications: Kumar, Sanjay, et al. "Double negative acoustic metastructure for attenuation of acoustic emissions." Applied Physics Letters 112.10 (2018): 101905.; Kumar, Sanjay, et al. "Tapered lateral flow immunoassay based point-of-care diagnostic device for ultrasensitive colorimetric detection of dengue NS1." Biomicrofluidics 12.3 (2018): 034104.; Bhatt, Geeta, et al. "Dielectrophoresis assisted impedance spectroscopy for detection of gold-conjugated amplified DNA samples." Sensors and Actuators B: Chemical 288 (2019): 442-453.; Basu, Aviru Kumar, et al. "Poly-L-Lysine functionalised MWCNT-rGO nanosheets based 3-d hybrid structure for femtomolar level cholesterol detection using cantilever based sensing platform." Scientific reports 9.1 (2019): 1-13.; Sundriyal, Poonam et.al. "Inkjet-printed electrodes on A4 paper substrates for low-cost, disposable, and flexible asymmetric supercapacitors." ACS applied materials & interfaces 9.44 (2017): 38507-38521.; Chauhan, Pankaj Singh, and Shantanu Bhattacharya. "Highly sensitive V2O5• 1.6 H2O nanostructures for sensing of helium gas at room temperature." Materials Letters 217 (2018): 83-87.; Bhatt, Geeta, et al. "Impact of surface roughness on dielectrophoretically assisted concentration of microorganisms over PCB based platforms." Biomedical microdevices 19.2 (2017): 28.; Nayak, Monalisha, et al. "Integrated sorting, concentration and real time PCR based detection system for sensitive detection of microorganisms." Scientific reports 3.1 (2013): 1-7.; Kant, Rishi, Deepak Singh, and Shantanu Bhattacharya. "Digitally controlled portable micropump for transport of live micro-organisms." Sensors and Actuators A: Physical 265 (2017): 138-151.	
Related Grants: Department of Science and Technology, Water Treatment Initiative, "Installation of a pilot plant of 10 KLD capacity comprising ZnO-Graphene based sensitive photo catalytic filter for visible light catalysis and carbon nano-mat fiber filter for the treatment of the effluent of CETP, Jodhpur as a replacement of their secondary treatment unit and development of an alternative low cost process for dye adsorption on acid modified soil", Funded (Amount: 120,00,000 INR, USD \$ 176470), PI; Indian Space research organization, "Development of a Gas Sensor to detect leakage of Helium gas from Inflatable Space Structures", Funded (Amount: 1976000 INR, USD \$29059). PI; Department of Science and Technology, Instrumentation development committee, "A novel labeled electronic gene identification system using impedance spectroscopy for molecular diagnostics of water and food borne pathogens", Funded (Amount: 42,00,000 INR, USD \$65625). PI; Department of Science and Technology, Technology Systems Development Platform, "Inkjet printed electrodes of Graphene oxide- Metal oxide hierarchical nanostructured nanocomposites for improved energy density and power density thin flexible supercapacitors" Funded (Amount: 40,00,000 INR, USD \$65625). PI; BIRAC, Department of Biotechnology, "Lateral Flow Immunoassay based Point-of- Care Diagnostic Device for Ultrasensitive Colorimetric Detection of Dengue " Funded to TCIP a technology company incubated by PI Funded (Amount: 50,00,000 INR, USD 70,000);	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Boeing Corporation, USA, "Additive Manufacturing of Functionally Engineered Materials". Funded (April 2016) (Amount: 59,50,000 INR, Eq. USD 87,500). PI;

Department of Science and Technology, SERB, Government of India "A novel high efficiency micro-scale gene transfection system using nanoenergetic materials", Funded (August 2012) (Amount 31,00,000INR, Eq. USD \$62,000). PI;

Department of Biotechnology, Food and Nutrition Security, Government of India. "Development of Biosensors Using Nano-scale Materials", Funded (August 2012) (Amount:45,00,000 INR, Eq. USD \$ 90,000). PI;

(6) Boeing Corporation, competitively funded proposal through the university relations program of Boeing "Design and development of a completely autonomous ground and aerial navigation system", Funded (January-2008~ December-2014). (Amount:;

National Program on Micro and Smart Structures (NPMASS), Government of India, "MEMS design center at IIT Kanpur", Funded (March 2009). (Amount: 3198500 INR, Eq. USD \$48462). PI;

(8) National Program on Micro and Smart Structures (NPMASS), Government of India, "Miniaturized polymeric fluidic pumps based on principle of peristalsis", Funded (March 2011). (Amount: 52,50,000 INR, Eq. USD \$105,000). PI

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Somesh Kumar Mathur	Position: Professor, Economic Sciences
Email: skmathur@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: www.iitk.ac.in	
Short Bio: Professor S.K. Mathur received his PhD in economics from the ITD division of the JNU in 2005. Professor Mathur has 25 years of teaching and research experience. Professor Mathur's specialization lies in international trade, applied econometrics, growth economics and spatial economy and mathematical modelling. Prof Mathur has at least five books in his name, one on trade from Palgrave Macmillan and one in Spanish with Ecuadorian collaborators. At present, Professor Mathur teaches Trade, Econometrics and Math Econ to graduate and PhD students of the IIT Kanpur.	
Research Interest Keywords: international trade; applied econometrics; Applied General Equilibrium; Spatial Economics; Econometric Theory; New Growth Theories; Growth Econometrics; AI; ML; Deep Learning	
Summary of Research Interests: For the past decade, we have witnessed increasing fragmentation of production of goods and services associated with conception of new ideas, design, production, marketing, transportation, end services and product delivery processes all around. Such processes are value chains which are getting interconnected through international trade. Countries like China, Germany, Italy, Vietnam, UK, Austria, France, Canada, Belgium, Ethiopia, Spain, Thailand, Switzerland among others are increasing partic	
Smart City Themes of Interest: Infrastructure and Technology; Economic Development; Mobility and Transport; Urban Planning; Energy, Waste and Water	
Related Publications:	
Related Grants:	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Subhankar Mukherjee	Position: Assistant Professor, Department of Industrial & Management Engineering
Email: subhankar@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: https://www.iitk.ac.in/new/subhankar-mukherjee	
Short Bio: Subhankar Mukherjee is Assistant Professor in the Department of Industrial & Management Engineering, Indian Institute of Technology Kanpur. He obtained his PhD from Indian Institute of Management Calcutta, with specialization in Economics. Prior to that, he completed the IPMX (one-year full time MBA programme) from IIM Lucknow, and bachelor's in mechanical engineering from Jadavpur university, Kolkata. His research interests are in the areas of economics of development and applied microeconomics. His research has been published in Economic and Political Weekly, Review of Agrarian Studies, European Journal of Development Research, among others. At IIT Kanpur, he teaches courses in economics and econometric methods.	
Research Interest Keywords: Economics of Development, Applied Microeconomics	
Summary of Research Interests: Subhankar's broad research interest is in the area of economic development. The primary approach of his research is empirical in nature, in which he uses either primary survey data, or secondary datasets, and employs econometric methods to test theories of economic development.	
Smart City Themes of Interest: Economic Development; Health and Well-being; Energy, Water & Waste; Food Security & Agriculture.	
Related Publications: <ol style="list-style-type: none"> 1. "Financial Inclusion and Household Welfare: An Entropy Based Consumption Diversification Approach" with Manisha Chakrabarty, <i>European Journal of Development Research</i>, forthcoming. 2. "On Improving Awareness about Crop Insurance in India" with Parthapratim Pal, <i>Review of Agrarian Studies</i>, 9 (1), (2019): 46-68. 3. "You Win Some, You Lose Some, and Some Get Rained Out: A Study of Some Recent Trade Policy Instruments Used by India in the Context of Neoliberalism" with Parthapratim Pal, in P. K. Biswas, P. Das (eds.), <i>Indian Economy: Reforms and Development</i>, (Springer Edited Volume on India Studies in Business and Economics Series), 2019. 4. "Impediments to the Spread of Crop Insurance in India" with Parthapratim Pal, <i>Economic and Political Weekly</i>, 52 (35), (2017): 16-19. vol. XLIII No. 17, 1-15 September, 2017. 	
Related Grants:	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Tarun Gupta	Position: Professor and currently Associate Dean of R&D, Civil Engineering, Affiliated with Design Program and Center for Environmental Science and Engineering
Email: tarun@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: https://www.researchgate.net/profile/Tarun_Gupta5 https://in.linkedin.com/in/tarun-gupta-96043b86	
Short Bio: Tarun Gupta earned doctorate from Harvard & MTech from IITBombay. He authored >125 journal publications, 4 patents, two technology transfer to industry and BARC & reviewer of >36 ISI indexed journals. He won VNMM Award, INAE Innovator and Entrepreneur Award 2018, NASI Scopus Young Scientist Award 2015, INSA Medal for Young Scientist 2011, INAE Young Engineer Award 2009 & IEI Young Engineer Award 2008. Research interests: development of instruments for aerosol measurement, formation of SOA, personal exposure assessment, source apportionment of air pollution, formation & control of engine exhaust emissions, human risk assessment, sensors for smart city.	
Research Interest Keywords: aerosol, aerosol measurement, air pollution, sensors for aerosol, Secondary organic aerosol, risk assessment, toxicology, source apportionment, air pollution control, exposure assessment	
Summary of Research Interests: Research interests: development of instruments for aerosol measurement, formation of SOA, personal exposure assessment, source apportionment of air pollution, formation & control of engine exhaust emissions, human risk assessment, sensors for smart city.	
Smart City Themes of Interest: Infrastructure and Technology; Mobility and Transport; Health and Well being; Energy, Waste and Water	
Related Publications: https://www.researchgate.net/profile/Tarun_Gupta5	
Related Grants: https://www.researchgate.net/profile/Tarun_Gupta5	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Venkatesan Kanagaraj	Position: Assistant Professor, Department of Civil Engineering
Email: venkatk@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: https://www.iitk.ac.in/new/venkatesan-kanagaraj	
Short Bio: I received my Ph. D in Civil Engineering from Indian Institute of Technology, Madras (2011). My research interests are traffic flow modelling, traffic simulation, traffic video analytics, and connected and autonomous vehicles. From Oct 2013-till date, I worked as a post-doctoral fellow in Technion - Israel Institute of Technology, Israel and Technical University Dresden, Germany. During this period, I got a most prestigious and generous awards include an PBC Fellowship Program for Outstanding Post-Doctoral Researchers (Israel Council for Higher Education), Humboldt Research Fellowship (Alexander Von Humboldt Foundation) and Marie Curie Individual Fellowship (European Commission). I had visited three computer vision related labs: Center for Research in Computer Vision, University of Central Florida, USA (Aug–Oct 2016); Computer Science Department, Rutgers University, USA (Nov 2016); Institute for Advanced Simulation, Jülich Supercomputing Center (April–June 2016). I have published 12 articles in high ranked journals and two book chapters in the context of driver behavior modeling, traffic simulation, etc. Some of the German famous daily newspapers published our research work to common public. For example: http://www.sz-online.de/nachrichten/ein-weg-in-sicherheit3197255.html . Recently, I graduated world's first self-driving car degree course from UDACITY.	
Research Interest Keywords: Connected and Autonomous Vehicles, Intelligent Transportation system, Traffic Flow Theory, Traffic simulation, Crowd Dynamics	
Summary of Research Interests: Path planning algorithms for autonomous vehicles in mixed traffic conditions Artificial Intelligence Applications in Smart Mobility Microscopic traffic flow modelling in disordered flows Traffic simulation with V2X Communication Traffic safety and Crowd dynamics	
Smart City Themes of Interest: Mobility and Transport	
Related Publications: Kanagaraj, V., Treiber, M.: Self-driven Particle Model for Mixed Traffic and Other Disordered Flows. Physica A (Elsevier), 509, pp. 1-11.; Kanagaraj, V., Srinivasan, K. K., Sivanandan, R., Asaithambi, G. (2015): Modeling Unique Merging Behavior under Mixed Traffic Conditions. Transportation Research Part F: Traffic Psychology and Behaviour (Elsevier), 29, 98-112.; Treiber, M., Kanagaraj, V. (2015): Comparing Numerical Integration Schemes for Time Continuous Car-following Models. Physica A (Elsevier), 419, 183-195.; Kanagaraj, V., Asaithambi G., Toledo, T., Lee, T. C. (2015): Trajectory Data and Flow Characteristics of Mixed Traffic. Transportation Research Record 2491, Transportation Research Board, Washington D.C., USA, 1-11.; Kanagaraj, V., Srinivasan, K. K., Sivanandan, R. (2010): Modeling Vehicular Merging Behavior under Heterogeneous Traffic Conditions. Transportation Research Record 2188, Transportation Research Board, Washington D.C. USA, 140-147.	
Related Grants: Marie Curie Individual Fellowship, TU Dresden, funded by European Commission, Worth - Euro 172800.; Humboldt Research Fellowship, TU Dresden, funded by Alexander Von Humboldt Foundation, Worth - Euro 82800.; PBC Fellowship Program for Outstanding Post-Doctoral Researchers, Technion ☐ Israel Institute of Technology, funded by Israel council for higher education, Worth - Euro 46000.	

Asian Smart Cities Research Innovation Network (ASCRIN)

Academic Profiles

Name: Vipin B	Position: Assistant Professor, Industrial & Management Engineering
Email: vipin@iitk.ac.in	Name of Institution: IIT Kanpur
Link to online profile: https://www.iitk.ac.in/new/vipin-b	
Short Bio: I am an Assistant Professor in the Department of Industrial and Management Engineering, IIT Kanpur. I completed his PhD in Operations Management from IIT Madras in 2017. I am a recipient of DAAD fellowship. My research interests include supply chain contracts, behavioural operations, sustainable operations, and healthcare operations management. My research articles have appeared in journals such as European Journal of Operational Research, Omega, Resources, Conservation & Recycling, Annals of Operations Research and Vaccine. I co-edited a book titled "Frontiers in Operations and Supply chain Management", published by Springer.	
Research Interest Keywords: Decision Theory, Behavioural Operations Management, Supply Chain Contracts, Optimization in Operations Management, Sustainable Operations, Healthcare Operations	
Summary of Research Interests: I work primarily in the applications of optimization, decisions theory, game theory in operations management setting. My problems of interest include sustainable supply chain management, healthcare operations, behavioural operations and supply chain management, and agricultural supply chain management. I am interested in analysing the impact of policies on the business ecosystems.	
Smart City Themes of Interest: Energy, waste, and water; Economic development; Food security and agriculture; Health and wellbeing	
Related Publications: <ul style="list-style-type: none"> Shukla, M., Vipin, B., Sengupta, R. N. (2022) Impact of dynamic flexible capacity on reverse logistics network design with environmental concerns, Annals of Operations Research (forthcoming) Vipin, B., Amit, R. K. (2021) Wholesale Price versus Buyback: A Comparison of Contracts in a Supply Chain with a Behavioral Retailer. Computers & Industrial Engineering, 162, 107689 Chandra, D., Vipin, B. (2021) On the vaccine supply chain coordination under subsidy contract. Vaccine 39(30), 4039-4045. Joshi, B. V., Vipin, B., Ramkumar, J., and Amit, R. K. (2021) Impact of policy instruments on lead-acid battery recycling: a system dynamics approach. Resources, Conservation and Recycling, 169, 105528 Vipin, B., and Amit, R. K. (2019). Describing decision bias in the newsvendor problem: A prospect theory model. Omega, 82, 132-141 Vipin, B., and Amit, R. K. (2017). Loss aversion and rationality in the newsvendor problem under recourse option. European Journal of Operational Research, 261(2), 563-571 	
Related Grants: Behavioural modelling of financially constrained supply chain, funded by Dean R&D, IIT Kanpur for the duration 2020-2022 with INR 6,85,000	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Vipul Arora	Position: Assistant Professor, Electrical Engineering		
Email: vipular@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur		
Link to online profile: http://home.iitk.ac.in/~vipular/			
Short Bio: I received my B.Tech. and Ph.D. degrees in Electrical Engineering from the Indian Institute of Technology (IIT) Kanpur, India. My Ph.D. thesis was entitled "Analysis of Pitched Polyphonic Music for Source Transcription", where I worked on analyzing music audio to identify and transcribe different instruments/voices playing simultaneously. During postdoc at Oxford University (UK), I developed speech recognition systems using linguistic principles, with applications in automatic language teacher and speech recognition for low-resource languages. At Amazon in Boston (USA), I worked on audio classification for developing Alexa home security system, with research focusing on classification with imbalanced data. I joined as assistant professor in the department of Electrical Engineering at IIT Kanpur in October 2018.			
Research Interest Keywords: Machine Learning, Education, Audio Analysis, Speech Recognition, Natural Language Processing, Semantic learning			
Summary of Research Interests: I am working in the science of cognition and learning - developing the theory that can take us to the next level of AI and machine learning. On the application side, I have been working on audio processing for more than 11 years. I am mostly working on music analysis, acoustic scene analysis, speech diarization and recognition, Brain computer interface and NLP for education. With some collaborators from MIT and Harvard, I am working on using machine learning for problems in physics.			
Smart City Themes of Interest: Health and Well being; Cultural Heritage			
Related Publications: Vipul Arora, Ming Sun and Chao Wang, "Deep Embeddings for Rare Audio Event Detection With Imbalanced Data", IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2019.; Vipul Arora, Aditi Lahiri and Henning Reetz, "Phonological feature-based ASR for mispronunciation detection and corrective feedback in L2 learning", Journal of Acoustical Society of America (JASA), vol. 143, no. 1, pp. 98-108, January 2018; Tharun Kumar Reddy, Vipul Arora and Laxmidhar Behera, "HJB-Equation-Based Optimal Learning Scheme for Neural Networks With Applications in Brain Computer Interface," IEEE Trans. Emerging Topics in Computational Intelligence, issue 99, pp. 1-12, August 201; Vipul Arora, Aditi Lahiri and Henning Reetz, "Phonological feature based mispronunciation detection and diagnosis using multitask DNNs and active learning", INTERSPEECH, Stockholm, 2017.; Satyam Kumar, Tharun Kumar Reddy, Vipul Arora, and Laxmidhar Behera, "Formulating Divergence Framework For Multiclass Motor Imagery EEG Brain Computer Interface", IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2020.; Tharun Kumar Reddy, Vipul Arora, Satyam Kumar, Laxmidhar Behera, Yukai Wang, Chin-Teng Lin, "Electroencephalogram based reaction time prediction with differential phase synchrony representations using co-operative multi-task deep neural networks", IEEE Tr; Vipul Arora and Laxmidhar Behera, "Musical source clustering and identification in polyphonic audio," IEEE/ACM Trans. Audio, Speech, and Lang. Process., vol. 22, no. 6, pp. 1003-1012, June 2014.; Vipul Arora and Laxmidhar Behera, "Semi-supervised polyphonic source identification using PLCA based graph clustering," in Proc. Intl. Symp. Music Inf. Retrieval (ISMIR), Curitiba, Brazil, November 2013. (Best Student Paper award); Vipul Arora and Laxmidhar Behera, "Instrument identification using PLCA over stretched manifolds," in Proc. National Conf. Communications (NCC), Kanpur, India, February 2014. (Best Paper award)			
Related Grants:			
1	Machine learning for Physics with focus on Quantum Chromodynamics Oct 2018 - Oct 2020;	IIT Kanpur	29.8 lakhs
2	Machine Learning for Lattice Quantum Chromodynamics March 2021;	SPARC MHRD	60.93 lakhs March 2019 -
3	Smart music tutor for Indian classical music (vocal and instrumental) 2019 - December 2021;	IMPRINT-2C SERB	70.3 lakhs December
4	Acoustic Scene Analysis with Deep Embeddings	ASEM-DUO	€ 6,000 January 2020 - December 2021

Profiles awaiting completion

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Anoop Singh	Position: Associate Professor, Industrial and Management Engineering
Email: anoops@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: www.iitk.ac.in/ime/anoops cer.iitk.ac.in eal.iitk.ac.in	
Short Bio:	
Research Interest Keywords:	
Summary of Research Interests:	
Smart City Themes of Interest:	
Related Publications:	
Related Grants:	

Name: Gaurav Tiwari	Position: Assistant Professor, Civil Engineering
Email: gauravt@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: https://www.iitk.ac.in/new/gaurav-tiwari	
Short Bio:	
Research Interest Keywords:	
Summary of Research Interests:	
Smart City Themes of Interest:	
Related Publications:	
Related Grants:	

Name: Jayant Kumar Singh	Position: Professor, Department of Chemical Engineering
Email: jayantks@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: http://www.iitk.ac.in/che/jks.htm https://www.linkedin.com/in/jayant-singh-a2882940/	
Short Bio:	
Research Interest Keywords:	
Summary of Research Interests:	
Smart City Themes of Interest:	
Related Publications:	
Related Grants:	

Name: Nagarajan Balasubramanian	Position: Professor, Department of Civil Engineering
Email: nagaraj@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile:	
Short Bio:	
Research Interest Keywords:	
Summary of Research Interests:	
Smart City Themes of Interest:	
Related Publications:	
Related Grants:	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Ritika Gautam	Position: Assistant Professor, Chemistry
Email: rgautam@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: http://www.iitk.ac.in/new/ritika-gautam	
Short Bio:	
Research Interest Keywords:	
Summary of Research Interests:	
Smart City Themes of Interest:	
Related Publications:	
Related Grants:	

Name: Saikat Chakrabarti	Position: Professor, Electrical Engineering
Email: saikatc@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: Dr. S. Chakrabarti completed his PhD in Electrical Engineering from Memorial University of Newfoundland, Canada in 2006. Before completing PhD, he worked in Asea Brown Boveri (ABB) Limited, India, and Bhabha Atomic Research Centre, India. After completing	
Short Bio: Smart city	
Research Interest Keywords: Smart grid, Microgrid <ul style="list-style-type: none"> • Power system state estimation • Power system dynamics and stability • Modelling of power system loads • Smart grid • Microgrid • Application of synchronized measurement technology to power systems 	
Summary of Research Interests:	
Smart City Themes of Interest: Infrastructure and Technology, Energy, Waste and Water	
Related Publications:	
Related Grants:	

Name: Santanu De	Position: Assistant Professor, Mechanical Engineering
Email: sde@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: home.iitk.ac.in/~sde	
Short Bio:	
Research Interest Keywords: Energy systems, Turbulent combustion, Lean premixed combustion, Biomass gasification, Micro gas turbines, Oxy-coal combustion, Solar Energy, Waste-to-Energy	
Summary of Research Interests:	
Smart City Themes of Interest: Energy, Waste and Water	
Related Publications:	
Related Grants:	

Asian Smart Cities Research Innovation Network (ASCRIN) Profile

Name: Shubham Sahay	Position: Assistant Professor, Electrical Engineering
Email: ssahay@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile: http://home.iitk.ac.in/~ssahay	
Short Bio:	
Research Interest Keywords:	
Summary of Research Interests:	
Smart City Themes of Interest:	
Related Publications:	
Related Grants:	

Name: Suresh Srivastava	Position:
Email: scs@iitk.ac.in	Name of Institution: Indian Institute of Technology Kanpur
Link to online profile:	
Short Bio:	
Research Interest Keywords:	
Summary of Research Interests:	
Smart City Themes of Interest:	
Related Publications:	
Related Grants:	

For any edits to profiles that you may require, please contact Diana Heatherich at ascrin@latrobe.edu.au with the details and they will be actioned as soon as possible.