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Research

My research focus is on techniques and algorithms for robotic explosive detection. Traditionally the underneath of cars is searched at checkpoints using mirrors or fixed road mounted cameras that the car traverses over. Such a solution involves danger to the person searching with the mirror or the driver driving over a camera checkpoint, particularly when remote or accelerometer triggered anti-personnel explosives are used. In contrast, using an autonomous robot can provide expedient and full coverage of the car from a safe distance.

My research combines an array of different fields including robotic navigation, path planning, image registration, rectification and analysis. Using a catadioptric camera, the car will be imaged significantly faster and with less complex path planning requirements due to the wide angle view of the camera. Optical flow sensors combined with LIDAR provide sensory information for obstacle avoidance and robot localisation.

