2024
PhD research opportunities

Seeking the brightest graduates to advance your career in industry supported world-class bioscience research

Apply today

The successful candidates will receive:

- A $35,000 p.a. (tax-free) scholarship up to three and a half years
- Training in Australia's first integrated agricultural systems biology research centre, AgriBio
- Professional development programs
- International travel opportunities

Based at AgriBio, the Centre for AgriBiosciences, Melbourne

Successful applicants must meet the Australian University entry requirements for a Doctor of Philosophy degree through our Higher Education partner, La Trobe University.

For enquiries and to apply, please forward a covering letter, your curriculum vitae (please include evidence of research writing) and academic transcripts to:

Kendra Whiteman
Higher Education Manager
Agriculture Victoria Research
kendra.whiteman@agriculture.vic.gov.au

Closing date for applications: until filled.

Artificial Intelligence-Driven Interfaces to Genomics

Aim

This project aims to develop Artificial Intelligence (AI)-augmented web applications to enhance user experience and facilitate genomic data interrogation
to maximise the utility of plant genetic resources (PGRs) conserved within the Australian Grains Genebank (AGG) for the Australian grains industry.

Background

The AGG is mandated to acquire, conserve, maintain and distribute grain crop genetic resources on behalf of the Australian grains industry. A $30M, 5-year multi-disciplinary Strategic Partnership between Agriculture Victoria Research (AVR) and the Grains Research and Development Corporation (GRDC) aims to bring genomic information into the PGR collection conserved within the AGG to increase its management and utilisation for the benefit of the Australian grains industry. A primary goal of the Partnership is to unlock the genetic potential of PGRs by linking them to research and breeding knowledge through genomic information.

Recent advancements in genomics research have led to an explosion of data, necessitating the need for sophisticated tools to enable data interrogation and mining. One such tool developed by AVR is *Pretzel*, which is an open-source web-based application for the real-time visualisation and analysis of multidimensional data from the scale of the nucleotide to pangenome. The utility of *Pretzel* for linking PGRs to research and breeding knowledge through genomic information would be enhanced by leveraging the capabilities of AI-based systems and Large Language Models (LLMs), such as ChatGPT's language understanding capabilities, to augment user experience and streamline the process of searching, finding, extracting and integrating research and breeding knowledge in *Pretzel*.

This PhD research aims to:

1) Integrate AI-based systems into *Pretzel* to provide a user-friendly interface, enabling researchers and breeders to interact with genomic data in a more intuitive and conversational manner.
2) Use LLMs to streamline the process of querying genomic data, reducing the need for users to understand exactly how to find what they need.
3) Combine LLMs with genomic data to facilitate knowledge discovery and uncover hidden patterns within the data that might be challenging to identify using traditional methods.

LA TROBE UNIVERSITY

GRDC GRAINS RESEARCH & DEVELOPMENT CORPORATION

AGRICULTURE VICTORIA