DARE
ARC Training Centre in
Data Analytics For Resources & Environments

Become a DARE PhD

Data Analytics for Resources and Environments (DARE) aims to deliver world leading data science for Australia's natural resources. This University of Sydney led Australian Research Council (ARC) Industrial Transformation Training Centre will offer data science PhD's with industry placement.

Understanding the cumulative impacts of our natural resource consumption and management has important long-term consequences for Australia's economic, societal and environmental health. Yet many decisions and policies are based on limited amounts of data and rudimentary data analysis, with little appreciation of the critical role that understanding and quantifying uncertainty plays in the process. The DARE Centre will develop and deliver the data science skills and tools for Australia's resource industries and stakeholders to make the best possible evidence-based decisions in exploiting and stewarding the nation's natural resources.

DARE is a unique world-leading Higher Research Degree (HDR) training centre in data science. Through an industry and government placement program, candidates will apply their data science skills to support best possible evidence-based management of the nation's natural resources.

We are searching for committed and excited PhD students to work on Centre projects starting in August 2020. Prospective candidates must have an understanding of the foundations of data science, for example a qualification in mathematics, statistics, computer science or a strong quantitative background such as engineering, econometrics or earth sciences.

DARE PhD candidates will undertake a cohort based learning and professional development program including advanced data science. Candidates may also undertake field work in rural and regional Australia as part of their one-year industry placement. Opportunities for conference presentations, exchange study with the Alan Turing Institute (UK) and employment in industry or government at the end of the program are also available.

For more information or to submit an expression of interest, contact
dare.centre@sydney.edu.au

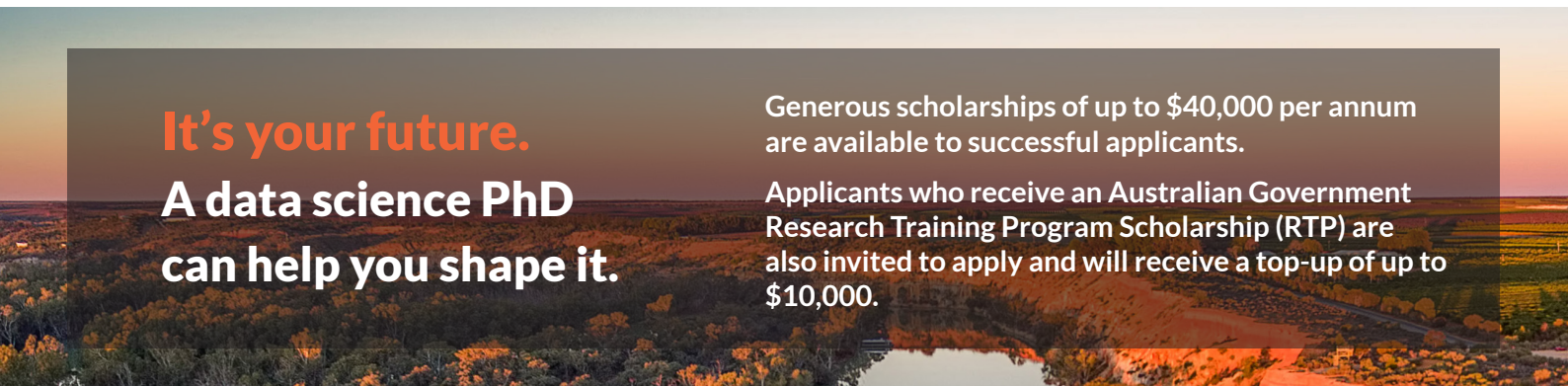
This program has been made possible through support from the Australian Government and our industry partners

Australian Government
Australian Research Council

THE UNIVERSITY OF SYDNEY

UNSW SYDNEY

THE UNIVERSITY OF WESTERN AUSTRALIA



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Current projects

Biodiversity

1. Bayesian Optimization for Sequential Sampling for Troglobites (WABSI)
2. Flexible methods for longitudinal data to predicting occupancy and distribution trajectories of forest dependent fauna and flora species (NRC)
3. Computationally efficient uncertainty quantification of deep learning models using LIDAR data to track forest health (NRC)

Water/Biodiversity

17. Copula Models for Multivariate Extremes (IAG)
18. Novel Multivariate Gaussian Processes for Prediction of Bushfires (DPIE)
19. Embedding SDEs in probabilistic models to model propagation of bushfires (DPIE/Minderoo)

Biodiversity/Minerals

4. GeoBiomics – Dimension Reduction and variable selection in BN to link geochemistry and biomics (GA)

Water

12. Variable selection and causal inference techniques for bacteria growth in water catchment areas (WaterNSW)
13. Flexible Spatial temporal models of impact of mining practices in catchment areas on surface and ground water quantity and quality. (WaterNSW)
14. Where has the water gone?. Probabilistic models for water balance dynamics (NSSN, WaterNSW)
15. Reef Evolution
16. Bayesian data fusion for the construction of global fishing Index (Minderoo)

Water/Minerals

10. Simulation methods for marginalization to constrain/map 3D hydraulic conductivity. (GA)
11. Environmental impact of Mines and water security (Newcrest)

Minerals

5. Novel transitions kernels in MCMC to explore posterior distribution of National Depth to Basement Map (GA)
6. Ensemble methods to improve process automation for sustainable mines (McKinsey)
7. Reducing uncertainty via Transfer Learning in process automation. (McKinsey)
8. Bayesian optimization for optimal drilling sequences for ore exploration (Newcrest, GA)
9. Computationally efficient uncertainty quantification of deep learning models for mine automation using LIDAR data. (Newcrest)

DARE partners

- IAG
- Newcrest
- McKinsey
- WABSI
- NSW Data Analytics Centre (DAC)
- Department of Planning and Environment (DPIE)
- Natural Resources Commission (NRC)
- Water NSW
- Minderoo
- NSW Smart Sensing Network (NSSN)
- Geoscience Australia