Position Description

Postdoctoral Fellow

Position Number: XXXXX
Position Title: Postdoctoral Fellow
Date Written: June 2019

Faculty / Division: Faculty of Engineering
School / Unit: School of Computer Science and Engineering
Position Level: Level A

ORGANISATIONAL ENVIRONMENT

UNSW is currently implementing a ten year strategy to 2025 and our ambition for the next decade is nothing less than to establish UNSW as Australia’s global university. We aspire to this in the belief that a great university, which is a global leader in discovery, innovation, impact, education and thought leadership, can make an enormous difference to the lives of people in Australia and around the world.

Following extensive consultation in 2015, we identified three strategic priority areas. Firstly, a drive for academic excellence in research and education. Universities are often classified as ‘research intensive’ or ‘teaching intensive’. UNSW is proud to be an exemplar of both. We are amongst a limited group of universities worldwide capable of delivering research excellence alongside the highest quality education on a large scale. Secondly, a passion for social engagement, which improves lives through advancing equality, diversity, open debate and economic progress. Thirdly, a commitment to achieving global impact through sharing our capability in research and education in the highest quality partnerships with institutions in both developed and emerging societies. We regard the interplay of academic excellence, social engagement and global impact as the hallmarks of a great forward-looking 21st century university.

To achieve this ambition we are attracting the very best academic and professional staff to play leadership roles in our organisation.

Values in Action: Our UNSW Behaviours

UNSW recognises the role of employees in driving a high performance culture. The behavioural expectations for UNSW are below.

Please refer to the UNSW Behavioural Indicators for the expectations of your career level (level A / B).

- **Delivers high performance and demonstrates service excellence.**

- **Thinks creatively and develops new ways of working. Initiates and embraces change.**

- **Works effectively within and across teams. Builds relationships with internal and external stakeholders to deliver on outcomes.**
Values individual differences and contributions of all people and promotes inclusion.

Treats others with dignity and empathy. Communicates with integrity and openness.

OVERVIEW OF RELEVANT AREA AND POSITION SUMMARY

The School of Computer Science and Engineering within UNSW is an international leader in research into Artificial Intelligence (AI) with Scientia Professor Toby Walsh awarded the ARC Laureate Fellowship on “Trustworthy AI”. The goal of the Trustworthy AI project is to study how to build and verify that an AI system makes fair decisions, which can be explained and audited, and are respectful of people’s privacy. Outputs will include tools to build trustworthy AI systems as well as policy recommendations to complement the technical tools. The project aims to return both economic and societal benefits to Australia as high-stake decisions in both the public and private sector are automated. More details can be found at http://www.cse.unsw.edu.au/~tw/TrustworthyAI.pdf

The Postdoctoral Fellow will join the Algorithmic Decision Theory (ADT) group which seeks to develop computational tools to support decision making. This involves multi-disciplinary research on the boundaries of optimisation, preferences, social choice, game theory, multi-agent systems, and machine learning. Research is driven by several transformative factors: the web (which is creating many new and exciting business models), big data (which is transforming the way we can optimise many industries), and environmental and financial pressures (which are forcing us to look for more optimal solutions). Current projects within the group include: representing and reasoning with preferences, computational social choice, fair division, game theoretic issues in distributed optimisation, and the intersection of machine learning and optimisation.

The role of Postdoctoral Fellow reports to Scientia Professor Toby Walsh and has no direct reports.

RESPONSIBILITIES

Specific responsibilities for this role include:

- **Level A**
  - Conducts research in the area of Artificial Intelligence (AI) systems independently and as part of a team which include:
    - Building models and designing mechanisms for problems in social choice such as resource allocation and facility location.
    - Mathematically analysing such models and mechanisms using tools such as computational complexity and game theory.
    - Extending these models and mechanism to take account of important features that promote trust such as explainability, auditability, privacy and verifiability.
    - Implementing and experimenting with such mechanisms on real world and synthetic data.
  - Contribute to the writing of scientific papers and reports for international journals and progress reporting to other researchers and industry partners.
  - Assist with the coordination of research activities and actively contribute to research outputs to meet project milestones.
  - Contribute to the preparation of research proposal submissions to funding bodies and actively seek collaboration with industry partners as appropriate.
- Participate in and/or present at conferences and/or workshops relevant to the project as required.
- Assist with the supervision of research students in the research area where required.
- Cooperate with all health and safety policies and procedures of the university and take all reasonable care to ensure that your actions or omissions do not impact on the health and safety of yourself or others.

**SELECTION CRITERIA**

**Level A:**

- PhD (or soon to be awarded) in Artificial Intelligence or related area such as computational economics.
- Demonstrated mathematics, statistics, and computer programming skills relevant to modelling of problems in social choice.
- Demonstrated ability to conduct independent research with limited supervision.
- Demonstrated track record of publications and conference presentations relative to opportunity.
- Demonstrated ability to work in a team, collaborate across disciplines and build effective relationships.
- Strong interpersonal skills with demonstrated ability to communicate and interact with a diverse range of stakeholders and students.
- Strong analytical and quantitative skills.
- Knowledge of health and safety responsibilities and commitment to attending relevant health and safety training.

*It is not the intention of the position description to limit the scope or accountabilities of the position but to highlight the most important aspects of the position. The aspects mentioned above may be altered in accordance with the changing requirements of the role.*