Position Details

Role summary for potential applicants

Advertised Job Title:	Postdoctoral Fellow - Stochastic Optimisation
Reference Number:	NSW12/03826
Classification:	CSOF4
Salary Range:	$78K-$85K plus up tp 15.4 % superannuation
Location:	North Ryde, NSW
Tenure:	3 years
Relocation Assistance:	☒ May be provided to the successful candidate **or** ☐ Not provided
Residency Status:	☐ Australian Citizens Only ☐ Australian Citizens and Permanent Residents Only ☒ All Candidates

Role Overview:
In this Postdoctoral Fellow role, you will be working on developing high performance innovative real options models for the analysis of complex decision issues facing the future of mineral industry, with emphasis on dealing with stochastic elements to model the uncertainty involved in long term planning. You will collaborate and network with the multi-disciplinary team of applied and financial mathematicians, operations researchers, statisticians, scientists and clients as well as publish papers in peer reviewed journals.

The aim of the research is to develop new mathematical models and computational algorithms to optimise long term planning decisions arising in minerals industry, taking into account the uncertain future. The value of any decision depends both on uncertain parameters (such as commodity prices) and the ability to respond to changing circumstances in the future. The important requirement for long-term decisions in minerals industry is the need to limit the undesirable social and environmental implications, while maximising the economic profit. The problems typically involve many stochastic variables, interconnected and path-dependent decisions (real options) and dynamic constraints. The research to tackle such problems involves a combination of techniques including concepts and methods from real options and financial options pricing methods, stochastic dynamic programming, and Monte Carlo simulations.

In this position you will be given the opportunity to develop innovative approaches to tackle such problems and to be involved in applying the methods to minerals projects as part of a broader CSIRO team. You will also have a chance to build your academic profile through publications and attending conferences. The position will also provide you with a range of training opportunities and experiences to build your capacity as a researcher. This includes the chance to work in a multi-disciplinary team with people of a range of scientific backgrounds, experience working with industry or government clients to deliver projects. Also CSIRO provides staff with a training courses and workshops on skills ranging from scientific paper writing to managing commercial projects and personal development.

Duties and Key Result Areas:

• Propose, develop and implement new mathematical models and optimisation algorithms for real options analysis of complex decision-making under uncertainty problems arising in minerals industry.

• Work as part of a team to apply the methods to several applications from the minerals industry to test their effectiveness and provide results to external clients.

• Actively engage in state, national and international conferences as well as deliver seminars or workshops within CSIRO and externally.

• Publish research findings through scientific reports, research proposals and scientific papers, helping ensure high standards of research products and improve uptake of research outcomes within industry and government.

• Assist to build CSIRO's research reputation for integrated and multi-disciplinary science related to services through networking activities and advisory roles/tasks.

• Contribute to the effective functioning of a research team to help deliver upon CSIRO's organisational objectives.

• Participate in CSIRO's Postdoctoral training program.

Selection Criteria:

Please note: Under CSIRO policy only applicants who meet all the essential criteria can be appointed

Pre-Requisite

1. PhD in a relevant discipline area such as Financial Mathematics, Applied Mathematics, Operations Research or related area with strong experience in stochastic optimisation.

The successful appointee must have completed, or will shortly complete, the requirements for a PhD degree in a relevant scientific discipline. Owing to terms of the fellowship, candidates must not have more than 3 years of relevant Postdoctoral experience.

Essential Criteria:

1. Demonstrated knowledge of and experience in stochastic dynamic optimisation methods and solution approaches (e.g., stochastic dynamic programming, stochastic integer programming)

and/or financial engineering.

2. Demonstrated ability to carry out research and to publish in Mathematical Sciences or related areas with a strong interest in applied/industrial research.
3. Demonstrated extensive experience in computer programming and the use of computer languages such as C, C++ or Java.
4. Strong written and oral communication skills including an ability to publish research results, write reports and make technical presentations to audiences with scientific and non-scientific background.
5. Proven ability to work independently and as part of an interdisciplinary team including the ability to build and maintain productive working relationships with colleagues and collaborators

Desirable Criteria:

6. Experience in real options analysis and/or options pricing, financial engineering.
7. Experience in time series analysis and stochastic modelling.

CSIRO is a values based organisation. In your application and at interview you will need to demonstrate behaviours aligned to our values of:

- Integrity of Excellent Science
- Trust & Respect
- Creative Spirit
- Delivering on Commitments
- Health, Safety & Sustainability

Other Information:

How to Apply:

Please apply for this position online at www.csiro.au/careers. You may be asked to provide additional information (online) relevant to the selection criteria. If so, then responding will enhance your application so please take the time to provide relevant succinct answers. Applicants who do not provide the information when requested may not be considered.

If you experience difficulties applying online call 1300 301 509 and someone will be able to assist you. Outside business hours please email: csiro-careers@csiro.au

IMPORTANT: Please upload your resume/curriculum vitae and other documents in MS Word only so they can be converted to PDF before being sent to the Selection Panel. Please note only two documents can be attached to your application.

Referees:

If you do not already have the names and contact details of two previous supervisors or academic / professional referees included in your resume/CV please add these before uploading your CV.

Contact: If after reading the selection documentation you require further information please contact -

Tanya Tarnopolskaya by email at tanya.tamopolskaya@csiro.au or by phone at +61 2 9325 3254.

Please do not email your application directly to Tanya Tarnopolskaya. *Applications received via this method will not be considered.*

About CSIRO: Australia is founding its future on science and innovation. Its national science agency, CSIRO is a powerhouse of ideas, technologies and skills for building prosperity, growth, health and sustainability. It serves governments, industries, business and communities across the nation. Find out more! www.csiro.au.

About CSIRO Mathematics, Informatics and Statistics (CMIS):

CMIS creates and uses innovative mathematical sciences to tackle Australia's big challenges like climate change, biosecurity, water security, energy for the future and many more. It provides expertise in statistics, mathematics, informatics and computational science to collaborators and customers in a range of areas including industrial processing, healthcare, biotechnology, environmental monitoring and Government and commercial services. One of 13 CSIRO divisions, CMIS has over 190 staff working across 7 cities.