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Data-driven process monitoring and control for the minerals industry

Postdoctoral Research Fellowship

Scope of Research: In the Machine Learning and Extractive Metallurgy research groups of the Department of Process Engineering at Stellenbosch University, a specific research focus is process monitoring and control for the mineral industry. Statistical- and machine learning techniques are explored in the context of dynamic simulation and real-world case studies to investigate promising approaches for cost effective and sustainable operation of mineral processing circuits.

The main role of the postdoctoral fellow will be to carry out research in data-driven process monitoring and control as applied to mineral processing case studies. This is achieved primarily through the identification of newly developed methods from various fields (e.g. neuroscience, robotics, etc) through literature studies, followed by application and evaluation thereof in the minerals processing context by means of algorithm studies. Specific duties include:

- Delivery of three literature surveys per year on recent advances in the field
- Delivery of three algorithm studies per year based on methods identified in the literature
- Publication and presentation of research
- Assistance with supervision of undergraduate and postgraduate students
- Contribution to the general activities of the research group, including data management, model curation, funding applications, etc.

The duration of the research position is 24 months, subject to performance reviews.

Host: The successful applicant will work under supervision of Prof Steven Bradshaw and Dr Tobi Louw.

Requirements: The post-doctoral fellow must have a keen interest and proven track record in the chemical or minerals processing industry. This must be supplemented by a strong foundation in mathematics and statistics to enable the researcher to effectively assess a variety of data-driven methods in terms of applicability to the minerals-processing field.

- A PhD obtained within the last five years in the field of mineral processing, extractive metallurgy, chemical engineering, or closely related field with a publication track record in international scientific journals.
- Strong programming skills (preferably in MATLAB and/or Python).
- Strong technical and analytical skills.
- Working knowledge of dynamic modelling, simulation, and control of chemical engineering processes, as well as statistics.
- Strong technical writing skills.
- Ability to take initiative and develop new research opportunities.

Conditions of employment: Please note that postdoctoral fellows are not appointed as employees and their fellowships are awarded tax free. They are therefore not eligible for employee benefits.

Commencement of duties: January 2021

Application closing date: 16 October 2020

Enquiries: Please submit your complete application (including cover letter, CV with details of at least 2 referees who may be contacted, relevant degree and other certificates) to Dr TM Louw (tmlouw@sun.ac.za). Applicants should request their referees to forward confidential reports to the same address.