## POSTDOCTORAL FELLOW Gibela Engineering Research Chair & The School for Data Science and Computational Thinking RESEARCH POSITION AVAILABLE

GIBELA Rail Transport Consortium is manufacturing 600 new passenger trains in South Africa and must maintain this fleet until 2035 ...



Do **YOU** want to be part of this journey?

**TECHNICAL FOCUS?** The GIBELA Engineering Research Chair at Stellenbosch University is developing **digital services where rail models are coupled to operational measurements and data-logs to support maintenance information and decisions**. This position will work with the School for Data Science and Computational Thinking to develop a digital twin where sensor measurements and data analytics automate the inspection of passing trains in a depot environment. Complimentary information is gathered from operational logs, maintenance schedules, safety incidents and service interventions. The technical scope of the research is expansive. The ideal candidate could contribute in a subset

of inter-disciplinary topics in engineering measurement, machine vision, advanced data analytics, signal processing, data fusion, data structuring, database engineering, dashboarding and digital services.

**WORK ENVIRONMENT?** The fellow will work within the vibrant activities of the GIBELA Engineering Research Chair and the School for Data Science and Computational Thinking with postgraduate students, academics and engineers from industry. The candidate can expect to enjoy fieldwork and regular interactions with the trains in the real rail environment. The Chair hosts the annual GIBELA seminar for student outputs and industry. Potential exists to support research travel to local and international conferences and collaborators. Read more about our work at www.gerc.sun.ac.za

## RESPONSIBILITIES

The fellow is expected to contribute expertise to prosper the work of the Gibela Engineering Research Chair and the School for Data Science and Computational Thinking. This could be through rail-specific experience or appropriate skills which can include:

- Measurement and analysis (Vibration, strain, displacement, force, camera vision, lidar, thermography, etc.)
- Software skills: such as MATLAB, Python, ...
- Simulation: dynamic models, finite element analysis, data-driven modelling.
- Data-driven modelling, statistics, large language models, ...
- Hybrid models, Kalmann filters...
- Data engineering, database management, SQL servers...
- Digital dashboards, Web-based services, Javascript...

The Chair and the School is committed to high-quality supervision. The ideal candidate should be available in Stellenbosch (not work remotely) and be willing to propose and supervise topics for final-year and master's students. They should demonstrate both technical expertise and enthusiasm, contributing to the development of students while supporting a broader cohort within the Chair's research group.

A key objective of the Chair is to enhance the quality and impact of research outputs. The fellow is expected to work towards publishing in accredited conferences and journals recognized by the Department of Higher Education and Training. The target is to produce two accredited articles per year with at least one in an international journal article per year during the fellowship.

The Chair is funded by the Gibela Rail Transport Consortium and the School for Data Science and Computational Thinking and has a strong mandate to collaborate with industry partners. The fellow will play a crucial role in fostering this partnership through technical and relational engagement, including collaborative meetings, research scoping, and training initiatives.

## WHO SHOULD APPLY? Post-doctoral fellowships require a PhD qualification obtained within the past five years from a reputable university.

Although the position is hosted in the Department for Mechanical and Mechatronic Engineering and the School for Data Science and Computational Thinking, the work of the Chair is faculty wide. The ideal candidate could be skilled in civil-, electrical-, mechanical-, mechatronic- or data engineering. The candidate must have strong data and digital skills. Applicants should be openminded, self-driven, energetic, and optimistic, demonstrating a strong ability to work independently and collaboratively in a multidisciplinary environment. The position includes:

- A post-doctoral bursary of R350k.
- Laptop and workspace.
- Additional stipend for short course development.
- Additional support for local and international conferences are allocated on an ad-hoc basis.

The position is full-time and applicants may not hold a fellowship or additional work commitment simultaneously.

## WHERE CAN YOU APPLY?

Contact Professor Annie Bekker: <u>annieb@sun.ac.za</u>

Please send:

- 1. A one page (500 words) application essay in which you emphasise your applicable expertise and aspirations for the fellowship.
- 2. Curriculum Vitae with contactable references.
- 3. Certified Proof of Qualification.

The application is open until a suitable candidate is identified.