UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI
COLLEGE OF AGRICULTURE, ENGINEERING AND SCIENCE

The University of KwaZulu-Natal (UKZN) is committed to employment equity with the intention of promoting representativity within the institution. Preference will be given to South African applicants from the designated groups in accordance with our Employment Equity Plan.

COLLEGE OF AGRICULTURE, ENGINEERING AND SCIENCE

POST-DOCTORAL FELLOWSHIP (1 POST) 01 JULY 2025 – 31 JUNE 2026

Postdoctoral Research Opportunity in Smart and Intelligent Transportation Systems

KwaZulu-Natal Department of Transport (**KZNDoT**) Chair in Sustainable Transportation & The Sustainable Transportation Research group (**STRg**)
School of Engineering, University of KwaZulu-Natal (**UKZN**)

Howard College Campus - Durban

REF NO. ENG-STRg-PD3

The KZNDoT Chair in Sustainable Transportation and STRg at the University of KwaZulu-Natal (UKZN) invite applications for a Postdoctoral Research Fellowship in Smart and Intelligent Transportation Systems (ITS). This opportunity is ideal for highly motivated researchers with expertise in AI, IoT, big data analytics, and transportation engineering who are eager to contribute to cutting-edge advancements in ITS, particularly in the context of developing regions.

Research Focus Areas

The postdoctoral research will focus on:

- AI-Driven ITS Optimization
  - Developing predictive analytics and machine learning models (e.g., neural networks, decision trees, support vector machines) for traffic flow optimization, safety enhancement, and congestion mitigation.
  - Exploring hybrid AI techniques (e.g., combining Artificial Neural Networks and Recurrent Neural Networks) to improve urban transportation efficiency.
  - Designing AI-driven adaptive traffic control systems for real-time congestion management.
- IoT and Big Data in Transportation

    - Leveraging IoT-based traffic monitoring systems for real-time data collection and urban mobility planning.
    - Integrating big data analytics for demand-responsive transport, Mobility-as-a-Service (MaaS) solutions, and adaptive decision-making.
    - Investigating real-time data fusion techniques to enhance ITS frameworks.
- Sustainable Smart Mobility
    - Integrating electric vehicles and multimodal transport solutions for sustainable urban mobility.
    - Developing smart ticketing systems and transport security solutions to enhance user experience and safety.
    - Exploring blockchain-enabled public transport systems for secure and transparent transportation transactions.
- ITS for Developing Economies
    - Investigating strategies to overcome infrastructure constraints and socio-economic disparities in ITS deployment.
    - Leveraging mobile technologies and low-cost IoT solutions for ITS adaptation in developing regions.
    - Exploring public-private partnerships for infrastructure development and ITS implementation.
- Cybersecurity in Transportation
    - Developing robust encryption protocols and cybersecurity frameworks to mitigate vulnerabilities in ITS networks.
    - Addressing the challenges of increased connectivity and potential cyber threats in smart transportation systems.
- Blockchain-Enabled Public Transport
    - Investigating the role of blockchain technology in enhancing safety, efficiency, and transparency in public transport systems.
    - Developing blockchain-based solutions for secure and transparent transportation transactions.

Eligibility Criteria

Applicants must meet the following requirements:

- A PhD in Transportation Engineering, Computer Science, Electrical Engineering, Urban Planning, or a related field with a background in transportation.
- Strong background in AI, machine learning, IoT, big data analytics, or blockchain technologies.
- Experience in programming (e.g., Python, R, MATLAB) and data analysis tools.
- Knowledge of transportation systems, urban mobility, or related fields.
- Excellent written and verbal communication skills.
- A proven track record of research publications is an advantage.

Fellowship Details

- Duration: 1 year (renewable, subject to satisfactory performance)
- Location: University of KwaZulu-Natal, Durban, South Africa
- Funding: Competitive stipend of R 275 000.00 per annum.

Key Responsibilities

- Conduct high-quality, interdisciplinary research in the field.
- Develop and implement innovative AI, IoT, and big data-driven solutions for smart transportation systems.
- Collaborate with industry partners, policymakers, and chair funders to address real-world challenges.
- Publish research findings in top-tier journals and present at international conferences.
- Contribute to the development of grant proposals and research projects.
- Co-supervise postgraduate students.

Why Join Us?

- Work in a dynamic and interdisciplinary research environment.
- Access to state-of-the-art facilities and resources.
- Opportunities for collaboration with leading academic and industry partners.
- Competitive salary.
- Great chance to grow as an academic.
- Contribute to impactful research that addresses global transportation challenges.

Application Process

Interested candidates should submit the following:

- A detailed CV, including a list of publications.
- A research proposal outlining how their expertise aligns with the focus areas.
- Contact details of two academic referees.
- Full transcripts of academic records and copy of doctoral degree certificate or relevant evidence of pending completion.
- Copy of ID document (or copy of passport in the case of foreign applicants).

Deadline for Applications: 06 August 2025

- Submission & Inquiries: Please send applications to mostafam@ukzn.ac.za with the subject line "Postdoc Application – Smart Transportation Research".

This is an excellent opportunity to contribute to cutting-edge research with real-world applications in smart, sustainable, and inclusive mobility. We encourage talented and passionate researchers to apply!