**Research Focus Areas**

| Research group | Purpose of the research group | Profile of the research group | Members of the Research Group (NRF rating if applicable) |
|---|---|---|---|
| Ontology Engineering and Semantic Web Research Group<br><br>Focus Area<br><br>Artificial intelligence and machine learning | To investigate and apply computational methods for building advanced knowledge based systems for new generation web systems (Semantic Web). | The group interests are in ontology development, modularization, ranking, summarization and visualization, natural language processing, artificial intelligence, machine learning and data mining methods for the Semantic Web, knowledge representation and reasoning on the web, knowledge graphs and applications in areas such as image processing, remote sensing, climate change, agriculture, etc. | Dr Jean Vincent Fonou Dombeu |
| CAIR@UKZN: Applications of Machine Learning Research Group<br><br>Focus Area Artificial intelligence and machine learning | To develop ML-based solutions for modelling complex non-linear dynamic systems and sequential decision making. Our solution space is mainly comprised of deep learning techniques for reinforcement learning and sequence modelling. Our applications areas include (i) NLP, (ii) Sequential recommender systems, (iii) Social dynamics (ii) Time series modelling and outlier detection. | CAIR@UKZN is an affiliate of the national network of AI research – the Centre for Artificial Intelligence (CAIR – https://cair.za.net). Although still in the development phase, the group has graduated approx. 25 MSc students, and published approx. 35 articles in conferences and journals. The group has mentored 3 emerging academics (from Honours level) who have taken up lectureships within the discipline. The group is also heavily involved in organising the annual Southern African Conference for Artificial Intelligence Research (SACAIR) https://sacair.org.za | Mr Anban W. Pillay<br><br>Dr Edgar Jembere<br><br>Ms Sue Price<br><br>Mr Asad Jeewa<br><br>Mr Sibonelo Dlamini<br><br>Ms Yuvika Singh |

| | | | |
|---|---|---|---|
| | | and hosted the 2022 edition in Durban. CAIR@UKZN has attracted ongoing funding from the CSIR from its 4IR project. The group has collaborations with the Quantum Computing Research Group at UKZN, Social Psychology at UKZN and is investigating two more collaborations. | |
| Computer Vision and Machine Learning (CVML) Research Group<br><br>Focus Area<br>Artificial intelligence and machine learning | Modelling Machine Learning algorithms for accurate Medical Image Analysis, Remote Sensing and Climate change, and Computer Vision-related real-world problems. | The group's interests are in Computer Vision, Machine Learning, Medical Image Analysis, Image Processing, Biometrics, Pattern Recognition, Remote Sensing, Applied AI Algorithms, Distributed Computing for AI and AI for Climate Change. | Prof. Serestina Viriri (C2)<br><br>Miss Yuvika Singh |
| Computer Science Education Research Group<br><br>Focus Area<br>Best Teaching Practices and Computer-aided T&L | To recommend best teaching practices that are relevant to the highly volatile computer science education arena, and incorporate artificially intelligent technologies where desirable, viable, and feasible. | Research interests of the group are:<br><br>Best teaching practices for computer science education.<br><br>Recommender systems for developing lesson plans, and providing curriculum advice.<br><br>Computer-based education - Computer assisted teaching (assessment development) and learning (intelligent tutoring systems) | Mr Luke Vorster<br><br>Mrs Rosanne Els |

| | | | |
|---|---|---|---|
| Internet of Things Group.<br><br>Focus area Artificial Intelligence | To investigate and develop new techniques, methods, tools, etc. solving problems in different areas including HAR, Water, 5G/6G Networks, Precision agriculture, etc. | The group focuses on design and implementation of IoT techniques, methods, tools, etc. We apply some of these IoT techniques and AI in HAR, 5G/6G Networks, Precision agriculture, water. | Prof Paul Kogeda<br>kogedao@ukzn.ac.za |