CoRE AI

NITheCS
National Institute for Theoretical and Computational Sciences

The Africa-Europe Cluster of Research Excellence: Addressing Global and African Challenges Through Methods of Artificial Intelligence, Data Science, and Theoretical and Computational Thinking

presents a

MASTERCLASS:

A Practical Introduction to Reinforcement Learning

Thursday, 17 April 2025
South Africa: 11h00-13h00 SAST | UK: 10h00-12h00 (BST)

Teacher: Prof James Brusey (Coventry University, UK)

VENUES:
- Physics Seminar Room, Stellenbosch University, South Africa
- Swan Room, Elm Bank, Coventry University, United Kingdom
- Online

DESCRIPTOR

Reinforcement Learning is a hot area right now and a core part of the development of Large Language Models, Robotics, and superhuman performance in games such as Chess and Go. This masterclass will provide attendees with an understanding of the fundamentals and the tools to apply it to a variety of areas – anything from controlling a cement factory to car air-conditioning systems. We will begin with the theoretical underpinnings, including Markov Decision Processes and the key algorithms such as Policy Iteration. We will then build on this to add in function approximation that is required for many real-world problems, and other key approaches that go into modern algorithms. The tutorial exercises aim at familiarising you with open-source tools for use in your own projects.

PREREQUISITES

- Some Python coding experience essential.
- Must be able to install software (eg Anaconda) on computer to try out the examples.

TIME (SAST)	TITLE
11h00-12h00	Introduction to RL - An engaging lecture covering core concepts, definitions, and applications.
12h00-12h30	Developing RL from scratch for FrozenLake
12h30-12h45	MountainCar - using DQN, SAC, and PPO for continuous state spaces
12h45-13h00	Creating your own environments within Gymnasium

REGISTER: https://bit.ly/3FTcWVT

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