# PhD Position: Inverse Reinforcement Learning of Cheetah Locomotion

The job advert seeks a student to investigate the neuromechanics of legged manoeuvrability in the wild, specifically focusing on the cheetah as a model animal. The goal is to utilize inverse reinforcement learning to understand how animals negotiate trade-offs between competing requirements during high-speed manoeuvres. The study will investigate the best reward function to maximize for control of legged robotic systems inspired by animal motion. Inverse Reinforcement Learning (IRL) will be utilized to produce a reward function based on observed optimal motions. The successful student will investigate the application of IRL to analyse the mechanical system behaviour and rapid acceleration, as well as the application of cheetah reward functions to quadruped robots. This research aims to provide insights into the dynamics and control of legged locomotion in animals, which can inform the development of robust and agile robotic systems. This project is fully funded by Mathworks.
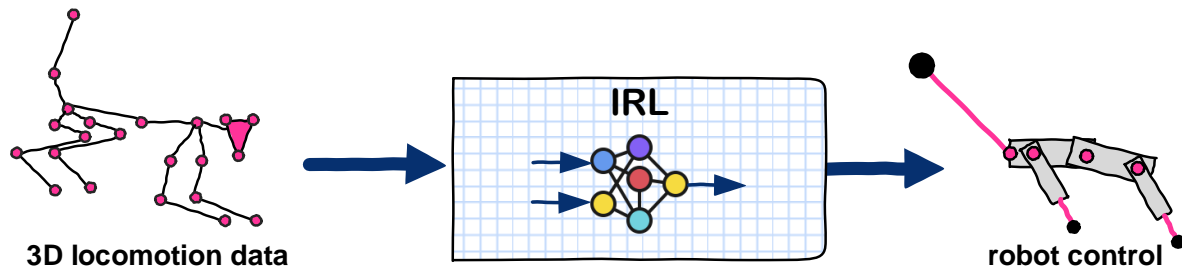


**Requirements**

- Master's degree (Electrical or Mechanical Engineering or Computer Science or related field).
- Strong skills in MATLAB and Python.
- Confidence with version control tools (specifically Git).
- A strong publication record would be advantageous.
- Good communication skills and ability/willingness to integrate within a multidisciplinary international research group.
- Applicants may not previously have held full-time permanent academic posts and be under 40 years old.
- Experience with reinforcement learning or legged robotics would be advantageous.

**Value and Tenure**

The value of the fellowship R240 000 stipend (tax-free) + tuition fees and is a **full-time position, based in Cape Town** for a period of three years. No relocation expenses are available, and the fellowship carries no benefits.

**About Us**

The African Robotics Unit (ARU) is a collection of robotics researchers in South Africa focused on studying problems we are uniquely positioned to solve. We are based at the University of Cape Town, the top-ranked university in Africa, which is situated in Cape Town, ranked in the top 25 cities in the world for travel.

**Application procedure**

<u>Applications close 30 April 2023</u> and must include the following:

- A 1-page cover letter explaining the candidate's suitability and experience, as well as their availability.
- The applicant's full curriculum vitae and a full list of publications.
- Link to applicant's Github page.
- The names and contact details of three academics who have taught, supervised, or worked alongside the applicant.
- Academic transcripts including undergraduate, honour's (if applicable) and master's (if completed already).

Potential candidates to email their applications as a single pdf to A/Prof. Amir Patel at (amir.patel@uct.ac.za) with the subject line "MATHWORKS PHD APPLICATION - IRL". Please check out our website and Google Scholar for more details on the work.