

# Avinash Ranganath

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## EDUCATION

### University Carlos III of Madrid, Leganes, Madrid, Spain

- Ph.D in Electrical, Electronics and Automation Engineering Sep 2013 – Oct 2016
  - Thesis: Locomotion through Morphology, Evolution and Learning for Legged and Limbless Robots
  - Adviser: Prof. Luis Moreno
  - Research areas: Robot locomotion, modular robotics, reinforcement learning, morphological computation, evolutionary robotics
- Master in Robotics and Automation Oct 2011 – Jun 2013
  - GPA: 8.8 / 10.0

### University of Edinburgh, Edinburgh, Scotland, UK

- Master of Science (MSc.) in Artificial Intelligence Sep 2008 – Nov 2009
  - Specialisation: Intelligent Robotics
  - Received University of Edinburgh International Masters Scholarship

### Bangalore University, Bangalore, Karnataka, India

- Bachelor of Computer Applications Jun 2001 – Jun 2004

## WORK EXPERIENCE

### Freelance Data Scientist, Stockholm, Sweden

Jan 2021 – Present

- Built a library for ETL of financial data
- Trained RL agents for controlling highly articulated virtual characters to play team sports in physics-based simulation
- Developed an ML model for predicting mineral deposits based on geochemical data
- Trained an RL agent for optimizing warehouse management
- Built an RL based automated options trading bot
- Trained Multi-Agent RL for finding optimal expansion strategies between competing firms while expanding internationally

### Accenture India, Bangalore, India

- Software Engineer Sep 2005 – Jul 2008
  - C++ developer in telecom domain

## RESEARCH EXPERIENCE

### School of Computing, Clemson University

- Postdoctoral Research Scientist Dec 2018 – Dec 2020
  - Project: Research on virtual character control using Deep Reinforcement Learning (DRL)
  - Supervisors: Dr. Victor Zordan and Dr. Ioannis Karamouzas
  - Research areas: Character control, motor-skill Learning, locomotion, DRL

### School of Computer Science and Communication, KTH

- Research Engineer at Robotics, Perception, and Learning Lab Jan 2017 – Aug 2018
  - Project: Research on deep learning techniques for semantic mapping of indoor environment through a mobile robot
  - Development of an open-source library called *LibSPN* for inference and learning in Sum Product Networks
  - Supervisor: Dr. Andrzej Pronobis
  - Research areas: Deep Learning, SPN

### Department of Systems Automation and Engineering, UC3M

- Research Assistant, Robotics Lab May 2010 – May 2015
  - Project: Research on distributed locomotion controllers for modular robots
  - Supervisor: Professor Luis Moreno
  - Research areas: Robot locomotion, modular robotics, reinforcement learning, morphological computation, evolutionary robotics

## IT University of Copenhagen

- Visiting Research Student, Software & Systems Section Aug 2013 – Sep 2013
  - Project: Investigate relationship between the morphology and emergence of behavior, in the context of robot locomotion
  - Supervisor: Prof. Kasper Stoy
  - Research areas: Robot locomotion, morphological computation, quadruped gait

## Intelligent Process Control and Robotics, Karlsruhe Institute of Technology

- Visiting Research Student, Collective and Microrobotics Group May 2009 – Aug 2009
  - Project: *Symbion* - Developed a Digital Hormone Method based distributed locomotion and navigation controller for modular robots
  - Supervisor: Dr. Marc Szymanski
  - Research areas: Modular robotics, collective intelligence, Digital Hormone Method

## TEACHING EXPERIENCE

### Graduate Level, Clemson University

- CPSC 8810: Motion Planning Spring 2020
  - As a guest lecturer, I taught the DRL part of the course

### Undergraduate Level, UC3M

- I was a teaching assistant for the following courses: 2010 – 2015
  - Industrial Informatics (15694)
  - Industrial Automation (13976)
  - Computer Organization (13885)
  - Computer Architecture (13888)

### Advisor Undergraduate Thesis


- Learning locomotion gait through hormone-based controller in modular robots June 2014
  - David Estévez Fernández, Bachelors, UC3M

## PUBLICATIONS

### JOURNAL

- [1] A. Brunete, A. Ranganath, S. Segovia, J. Perez de Frutos, M. Hernando and E. Gambao, “Current trends in reconfigurable modular robots design”, in *International Journal of Advanced Robotic Systems*, 14(3), DOI: 10.1177/1729881417710457, 2017.

### CONFERENCE & WORKSHOP

- [2] A. Ranganath A. Biswas, I. Karamouzas, and V Zordan, “Motor Babble: Morphology-Driven Coordinated Control of Articulated Characters”, in *Motion, Interaction and Games*, 2021, Lausanne, Switzerland, Nov 2021. 
- [3] A. Ranganath P. Xu, I. Karamouzas, and V Zordan, “Low Dimensional Motor Skill Learning Using Coactivation”, in *Motion, Interaction and Games*, 2019, Newcastle, UK, Oct 2019.
- [4] A. Pronobis, A. Ranganath and RP. Rao, “LibSPN: A Library for Learning and Inference with Sum-Product Networks and TensorFlow”, in *Workshop on Principled Approaches to Deep Learning, ICML 2017*, Sydney, Australia, Aug 2017.
- [5] A. Ranganath and L. Moren, “Gait generation through a feature based linear periodic function”, in *Mediterranean Conference on Control and Automation (MED)*, Torremolinos, Spain, Jun 2015.
- [6] A. Ranganath, J. Gonzalez-Gomez and L. Moren, “Morphology Dependent Distributed Controller for Locomotion in Modular Robots”, in *Post-Graduate Conference on Robotics and Development of Cognition*, Lausanne, Switzerland, Sep 2012.
- [7] A. Ranganath, J. Gonzalez-Gomez and L. Moren, “A distributed neural controller for locomotion in linear modular robotic configurations”, in *Proceedings of the 8th Workshop of RoboCity2030*, Madrid, Spain, May 2011.

## ACADEMIC AWARDS

- International Masters Scholarship, University of Edinburgh 2008
  - Awarded in support of postgraduate studies. One among only five in the department to receive the award
- Runner-up, Best student project, Pompeu Fabra University Sep 2011
  - Awarded for student project at the end of Barcelona cognition, brain and technology summer school
- JSE Achievers Award, Accenture India Sep 2006
  - Awarded for exceptional performance during the first year of employment at Accenture India

**LANGUAGES**

- English: Native or bilingual proficiency.
- Kannada: Native language.

**SKILLS**

C/C++, Python, TensorFlow, PyTorch Git.

[CV compiled on 2023-04-13]