

Arpit Kapoor

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EDUCATION

**SRM Institute of Science and Technology, Chennai — B.Tech
Computer Science and Engineering**

JUL 2015 - MAY 2019

CGPA: 9.01

Delhi Public School, Agra, Uttar Pradesh — CBSE Sr. Secondary

APRIL 2013 - MARCH 2015

Stream: Science | Percentage: 94.6%

EXPERIENCE

3Qi Labs, Hyderabad — Jr. Data Scientist

NOV 2019 - Present

Key Responsibilities:

- Develop Machine Learning models for Data Quality assurance such as time-series anomaly detection
- Worked on the backend for a Web application to quantify and maintain data quality using Machine Learning approaches.
- Develop Big data analysis pipelines in PySpark and Hadoop.

Bomotix, Hyderabad — Machine Learning Developer

JAN 2019 - NOV 2019

Project: **Player Tracking and Pose Estimation in Sports Videos**

Key Responsibilities:

- Research and development of Deep Learning driven Computer Vision models for object detection, object tracking and human pose estimation.
- Develop and maintain Continuous Integration Pipelines for Deep Learning models.
- Lead the Module documentation and requirement gathering effort

**The University of Sydney, NSW Australia — Research Intern
(Machine Learning)**

JUN 2018 - AUG 2018

Area of Research: **Bayesian Machine Learning**

Supervisor: Prof Sally Cripps and Dr Rohitash Chandra

Key Responsibilities:

- Bayesian Methods for neural networks and geoscientific models using parallel Markov Chain Monte Carlo (MCMC) methods.
- Projects include: Parallel MCMC methods for Neural Learning, Bayesian Transfer Learning, and Surrogate-assisted parallel MCMC.

PUBLICATIONS

"Bayesian neuroevolution using distributed swarm optimisation and tempered MCMC", submitted to *Neurocomputing* (Nov 2020)

"Surrogate-assisted Bayesian inversion for landscape and basin evolution models." *Geoscientific Model Development* 13, no. 7 (2020): 2959-2979.

"Surrogate-assisted parallel tempering for Bayesian neural learning." *Engineering Applications of Artificial Intelligence* 94 (2020): 103700.

"Bayesian neural multi-source transfer learning." *Neurocomputing* 378 (2020): 54-64.

"Teleoperation of a humanoid robot with motion imitation and legged locomotion." In *2018 3rd International Conference on Advanced Robotics and Mechatronics (ICARM)*, pp. 375-379. IEEE, 2018.

"Dynamic lateral balance of humanoid robots on unstable surfaces." In *2017 International Conference on Electrical, Electronics, Communication, Computer, and Optimization Techniques (ICEECCOT)*, pp. 1-6. IEEE, 2017.

"Reinforcement Learning Methods and Approaches for Humanoid Robotics", *4th International Conference on Artificial Intelligence and Evolutionary Computations in Engineering Systems. (Conference Presentation)*

CO-CURRICULAR ACTIVITIES

SRM Team Humanoid, SRM Institute of Science and Technology — *Team Leader*

SEP 2015 - PRESENT

- Led the University Humanoid Robotics Team of 22 active members
- Developed algorithms and software packages for control of humanoid robotic systems.
- Represented the University and won several accolades in various international robotics competitions.

PROJECTS

Deep RL Humanoid Maze solver

Hierarchical Reinforcement learning inspired approach used to teach a higher-order complex task to a humanoid, such as traversing a maze.

Bayesian neuroevolution via parallel MCMC

Synergy for neuroevolution with parallelly tempered MCMC methods for uncertainty quantification in gradient-less optimization approaches.

Bayesian neural Transfer Learning

Transfer Learning for Bayesian neural networks using a multi-chain parallel MCMC scheme published in Neuroevolution.

Humanoid Teleoperation

A humanoid robot that is controlled by a human from distance by extracting the pose information in 3D Space using an RGB-D camera

Gesture Controlled Robotic Manipulator

A robot arm with 6 degrees of freedoms that uses an RGB-D camera to detect gestures. The motion is replicated on the arm using inverse-kinematics.

Dynamic Lateral Balance of humanoid

The method generates a stable pose at any given point using the feedback from an Inertial Measurement Unit (IMU) in real-time which enables the robot to balance on dynamic surfaces.

Tic-Tac-Toe Playing Humanoid Robot

A humanoid robot capable of playing tic-tac-toe against a human opponent, powered by the minimax algorithm.

Person Detection and Tracking

Algorithm for detecting 10+ players in high paced sports videos and tracking them throughout the videos. Used Yolo V3 for person detection while a custom Siamese Re-Id Network and DeepSORT were used for tracking.

ACHIEVEMENTS

Received University Excellence scholarship in the Junior year

Secured a **Gold, 2 silver and a bronze** medal in **RoboGames'17**, the **USA** in humanoid league

Secured **3rd position** in IEEE/RSJ IROS 2017 Humanoid Application Challenge, held in Vancouver, Canada.

Recipient of **WATConsult Innovation Award** in BITS ATMOS'16 for Humanoid Teleoperation project.

Selected for **Engineering the Eye 5 Hackathon**(June 2016), organised by LVPEI, Hyd

Selected for fully compensated Research Internship at the University of Sydney

3 Publications in International Journals including IEEE and Elsevier

SKILLS

Programming languages

Python, C++, and R

Machine Learning

TensorFlow, PyTorch, Apache MxNet, Scikit-learn

Computer Vision

OpenCV

Robotic Software

Robot Operating System

Data Technologies

Hadoop, PySpark, ElasticSearch