Dhruv Kool Rajamani

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| 2015 - 2019 | **Graduation, BTech.** | Mechatronics Engineering, Manipal Institute of Technology, KA | $8.83^{/10}$ |
| 2012 - 2014 | **AISSCE, CBSE Delhi** | Vasant Valley School, Delhi | $95.00^{\%}$ |

INTERESTS

Legged Locomotion, Central Pattern Generators, Rehabilitative and Assistive Devices, Nonlinear Control

ACHIEVEMENTS

- Best Rover team from Asia, 8th out of 82 teams globally at the University Rover Challenge 2017, Utah.
- Best paper presentation at the iACT-2017 conference.
- Offered INSIPIRE scholarship by DST, Government of India for top 1% score in AISSCE 2014 – Declined

EXPERIENCE

BioRob — Prof. Auke Jan Ijspeert, Dr.Hamed Razavi, Jonathan Arreguit
École polytechnique fédérale de Lausanne (EPFL) — *January 2018 - Present*

- **Implementation of Walking Controller COMAN Robot(COmpliant HuMANoid Platform):**
  Developed a package using OROCOS RTT and ROS frameworks for simulating experiments on walking and implemented a controller for stepping, walking and active balance for the COMAN Humanoid Robot.

  OROCOS and ROS Packages   *Validation of the Simulation*

- **Development of a Neuromechanical framework to study animal locomotion [1]:**
  Developed a package using ROS along with appropriate analysis tools and controllers for simulating modular tetrapoda models with neuromechanical control algorithms.

  Click here to gain access to this repository

Autonomous Robotics Lab — Dr.Sudipto Mukherjee
Indian Institute of Technology, Delhi — *2017 – 2018*

- **Development of an Underactuated Flexible Manipulator using Differential Flatness:**
  Designed a 4-link planar manipulator on MATLAB and implemented a nonlinear control theory called *Differential Flatness*, allowing the end effector on the manipulator to follow a desired trajectory with just 2 non-colinear input forces.

  Simulation demonstrating the trajectory based control of a 4-link manipulator

Mars Rover Manipal — Dr.Y S Upadhyaya
Manipal Institute of Technology, KA — *2015 - 2017*

- **Development of a Mars Rover Prototype:**
  Developed a Mars Rover prototype that flaunts a modified rocker-bogie suspension, low pressure balloon tires, custom designed scientific testing mechanism, 6-DOF Robotic Arm and can run autonomously. It can traverse harsh Martian like terrain and steep gradients of approximately 1m height.

  * *Best Rover team from Asia, 8th out of 82 teams at the URC 2017.*

- **Robotic Arm Lead:**
  Design a 6 DOF Robotic Arm with a payload of 6kgs to conduct tasks similar to those performed by the Curiosity Rover, such as screwing/unscrewing, drilling, pick and place, etc. along with a self adapting gripper attachment.

  URC-2017   *Critical Design Review (2017)*   *Mars Rover Manipal*

Publications

Rajamani, D. K., E. D. Pitchika, K. S. Dhankar, and Y. S. Upadhyaya. "Design and development of a linear jawed gripper for unstructured environments." Manipal Journal of Science and Technology 3, no. 1 (June 2018). [link]

Presentations

December, 2017 *Bhabha Atomic Research Center*	**Rajamani, D. K.**, Pitchika, E. D., Dhankar K. S., Shorewala, S., Bansal, D., & Upadhyaya, Y. S.(n.d.). Design Overview of a Planetary Exploration Rover for Unstructured Terrain. 3rd International and 18th National Conference on Machines & Mechanisms.
July, 2017 *Manipal Institute of Technology*	**Rajamani, D. K.**, Pitchika, E. D., Dhankar K. S., & Upadhyaya, Y. S. (n.d.). Design and Development of a Linear Jawed Gripper for Unstructured Environments. International Conference on Applied Sciences, Engineering & Technology. (ISBN: 978-93-5279-058-6)
March, 2017 *Manipal Institute of Technology*	**Rajamani, D. K.**, Upadhyaya, Y. S., & Dhankar, K. S. (n.d.). A comparative Analysis of Industrial Grade Parallel Gripper and Linear Grippers. ISAB Industrial Automation and Control TechEvent Day, ISA Bangalore.

Technical Skills

Programming	C++, Python, C#, MATLAB, Simulink, Embedded C, LaTeX, Arduino, HTML, CSS, JS
Robotics Software	ROS, OROCOS, GazeboSim, RViz
CAD & CAM	ANSYS Mechanical Workbench, ADAMS, Soliworks, CATIA V6, AutoCAD, Blender

Projects

- **Obstacle detection and Path planning for an autonomous robot using computer vision and fuzzy logic.:** Implemented a heuristic based fuzzy logic approach for path planning through an unknown environment.
- **Traffic Detection using a Kalman Filter:** MATLAB Project to detect moving vehicles in a video feed from a traffic camera using Kalman filter and Feature detection.
- **LQR based control of a 3-link Linear Inverted Pendulum on a cart (LIP).:** Analysed the motion of a 3 link inverted pendulum on a moving base and design an optimal LQR based controller.