Dhruv Kool Rajamani

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Year	Degree, Board	Course, Institute	CPI/%
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**   Dr.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-Package Project Page   *ROS-Package Project Page*   Validation through Comparison

  - **Development of a Neuromechanical framework to study animal locomotion:**
    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

    This work was supported by the Human Frontier Science Program (HFSP) for the Robotics-Inspired Biology project.

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

  - **Development of an Underactuated Flexible Manipulator using Differential Flatness:**
    Designed a 3-link and 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 10kgs 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).

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. (Proceedings in Hard Copy)

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
Robotics Software	ROS, OROCOS, GazeboSim, RViz
CAD & CAM	ANSYS Mechanical Workbench, ADAMS, Soliworks, CATIA V6, AutoCAD, Blender

Projects

- **Obstacle detection and Path planning for a mobile 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.