

# ANANTH RACHAKONDA

## Curriculum Vitae

RoCon Lab, RRC

KCIS, IIIT, Hyderabad

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## Education

- 2022–Current **MS by Research, ECE(Spec. Robotics), IIIT, Hyderabad, (Full University Funded).**  
Dynamics, Planning, Nonlinear Adaptive-Robust, Safety-Critical and Learning-based Controls for Dexterous Hands, Bipedal Robots and Drones  
CGPA : 9/10
- 2015–2019 **Bachelor of Technology, EIE, CVRCE, Hyderabad, (Full State Funded).**  
Linear Systems, Communications, Signal Processing, Process Control, Circuit Design and Analysis, Instrumentation, Engineering Mathematics, Applied Physics, Algorithms and Data-Structures, Data Science Fundamentals  
CGPA : 9.16/10

## Publications

### Conference Proceedings(Accepted)

- 2023 **Swati Dantu\*, Rishabh Dev Yadav\*, Ananth Rachakonda\*, Spandan Roy, Simone Baldi,** Adaptive Anti-swing Control for Clasp Operations in Quadrotors with Cable-suspended Payload, **IEEE 62nd Conference on Decision and Control (CDC).**  
\* indicates equal contribution

### Patents(Granted)

- 2022 **Siva Kumar Kalepu, Keith James Trevor, Ananth Rachakonda, et al,** A Fully Functional Bionic Arm, **IP India.**  
First Inventor

## Research Experience

### International Institute of Information Technology, Hyderabad

- Jul, 2023 – **NMPC for Drones and Multi-fingered Hands.**  
Current A novel nonlinear tube MPC strategy for disturbance rejection in safety critical applications involving regulation, and set-point tracking for the developed bionic hand (grasp pose) and drone payload operations (altitude hold)  
Advisors : **Dr. Abhishek Dhar**, Post-Doc, Division of Automatic Control, Linköping University, Sweden  
**Dr. Spandan Roy**, Assistant Professor, Robotics Research Center, IIIT, Hyderabad
- Feb, 2023 – **A Dexterous Anthropomorphic Robotic Hand.**  
Current 4-dof digits to perform grasping and in-hand manipulation, its associated simulation pipeline, and end to end ROS Moveit based sim-hardware stack - custom plugins for model-based planning and control.
- Jun, 2022 – **A Novel Anthropomorphic Condylod-like Joint.**  
Jan, 2023 An anthropomorphic compliant tendon-driven condylod-like joint with kinematic and dynamic model, and stiffness analysis.
- Apr, 2022 – **An Anthropomorphic Bipedal Robot.**  
Current 4-dof legs. MuJoCo sim pipeline for learning, and model-based controls. Novel compact multistage planetary gearboxes of 1:168 reduction ratio to work with off the shelf MIT-cheetah actuators. Low-level control and configuration stack.

- Jun, 2022 – **Adaptive Anti-swing Control of Quadrotors with Cable-suspended Payload.**  
 Jan, 2023 Design and analysis of adaptive control strategy for considered drone and payload dynamics, implementation in ROS PX-4 Gazebo simulation suite, and on real hardware.  
 Advisor : **Dr. Spandan Roy**, Assistant Professor, Robotics Research Center, IIIT, Hyderabad  
[CVR College of Engineering, Hyderabad](#)
- Jun, 2017 – **STASIA - A Segway Robot.**  
 Jan, 2018 Robot Design, Underactuation, Linear Controller Design, Regulation, Robot Software Integration.
- Jun, 2018 – **VBEL - A Visual Servoing System.**  
 Jan, 2019 YOLO, Centroid Estimation, Error Dynamics, PID Gain Tuning, Tracking

## Industry Experience

- Dec, 2020 – **Senior Software Engineer**, Makers Hive Innovations Private Limited.  
 Nov, 2021 Responsible for software research and development engineering of the company's product line.
- Aug, 2019 – **Embedded Software Engineer**, Makers Hive Innovations Private Limited.  
 Dec, 2020 Ideated, designed, developed, integrated, optimized and tested the entire software stack of KalArm.

## Fellowships & Awards

- Sept, 2021 **IIIT International Student Travel Grant** to attend **IEEE Conference on Decision and Control, 2023** in Marina Bay Sands, Singapore.
- Dec, 2021 **IIIT Hyderabad Graduate Researcher Fellowship** as a MS by Research Graduate Research Assistantship  
 –Current
- August, 2021 Team KalArm MVP - A 2021 **Forbes Asia 100 to Watch** Company  
 2018 Recipient of **4th Runner up** and **3rd Prize** in the **Mitsubishi Electric Cup, India 2019 & 2018** respectively.

## Academic Achievements & Talks

- 2023 **Lectures** in "*MuJoCo for Contact Rich Learning of Bipedal Locomotion*", between 27th, September - 14th, October at **Qualcomm Research, Bengaluru.**
- 2021 **Honors** in AI at IAIC, CVR College of Engineering, Hyderabad
- 2015-2017 **Academic Achievement Award**, CVR College of Engineering, Hyderabad

## Software Stack

- Programming Python, C, C++, MATLAB  
 ML-DL PyTorch, Keras, Scikit-learn  
 CAD Fusion360, Onshape  
 Simulation Gazebo, MoveIt, MuJoCo, PyDrake, Simscape Multibody  
 Systems ROS 1, Stable Baselines 3, Mushroom RL, OpenAI Gym, Safety Control Gym, PX4, OpenCV  
 Optimization CVXPY, CasADi, MPT3, CVX

## Teaching

- 2023 .  
 Fall **Mentor, MLAIAS**, CCE, Indian Institute of Science, Bengaluru, TalentSprint.  
 Summer **RRC Summer School, Dynamics and Control**, IIIT Hyderabad.  
 2022 .  
 Summer **RRC Summer School, Dynamics and Control**, IIIT Hyderabad.  
 Winter **Electronics Workshop**, IIIT Hyderabad.