Harsh Sinha

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EDUCATION

IIT, KANPUR
Major in Electrical Engineering
Expected July 2019| IIT, Kanpur
BTech in Aerospace Engineering
Expected July 2019 | IIT, Kanpur

GRSS VIDYA MANDIR
Class XII | CBSE
Grad. May 2013| Bhagalpur, India

LINKS

Web:// **harshsinh.github.io**
Github:// **harshsinh**
LinkedIn:// **harsh-sinha**

COURSEWORK

ROBOTICS- CV & ML
Probabilistic Mobile Robotics
Autonomous Navigation
Visual Recognition
Modeling and Representation Techniques for Images
Probability and Statistics
Introduction to Machine Learning [Audit]
Data Structures and Algorithms

CONTROL SYSTEMS
Introduction to Control Systems
Modern Control Systems
Digital Control Systems
Optimal Space-flight Control
Flight Mechanics and Control

MISC
Signals, Systems and Networks
Digital Electronics
Power Electronics

SKILLS

PROGRAMMING
Languages :
C/C++ • Python • Bash
Frameworks and Libraries:
ROS • OpenCV • Pillow • PyTorch
SOFTWARE
MATLAB • LaTeX• Git • gEDA–pcb • Altium • GazeboSim • MicroSoft AirSim • SPICE • MicroCap

POSITIONS OF RESPONSIBILITY

TEAM LEADER
Intelligent Ground Vehicle
Nov'16-Jul'17

SELECTED PROJECTS

NYU TANDON, CRR LAB | Research Intern
May'18 - Ongoing | Under Prof. Farshad Khorrami | New York, USA

- Developed a generalized modular framework for Deep Reinforcement Learning [RL] for Optimal Navigation of visually-guided UAVs.
- Developed fully-modular-stack with Robot Operating System [ROS], Gazebo Sim, UAV [HectorQuad], Visual SLAM [SVO] and an RL module
- Implemented vanilla Policy Gradient and Maximum Likelihood Inverse-RL methods; Used implementation of a PPO for testing the framework.

QUAZAR | Industry Intern
May'16 – Jul'16 | Delhi, India

- Designed the PID and Phase Locked Loop System, Oscillation Control Electronics for the Scanning Probe for an Atomic Force Microscope
- Designed the PCB, implemented the preliminary drivers and tested the functioning with an AFM on Carbon Nano Tubes and Gold deposit

INTELLIGENT GROUND VEHICLE | Research Project
Expected Nov'16 – Apr'19 | IIT Kanpur | Under Prof. M Kothari, Prof. G Pandey

- Developed an Autonomous Waypoint Navigation and Lane Driving system on a ground robot using multi-sensor fusion, emulating Self-Driving Cars
- Worked on development & integration of software stack with SLAM[gmapping], Motion Planning [RRT] and Control using ROS along with a team of 15
- Mentored the development of various Computer Vision methods for Autonomous Lane driving and Obstacle avoidance

PUBLICATIONS

CONVOLUTIONAL NEURAL NETWORKS BASED SENSORS FOR MOBILE ROBOT RE-LOCALIZATION | Accepted at MMAR 2018
[Harsh Sinha, Jay Patrikar, Dhekane Eeshan, G. Pandey and M. Kothari]

AUTONOMOUS DETECTION AND TRACKING OF A HIGH-SPEED GROUND VEHICLE USING A QUADROTOR UAV | Accepted at AIAA SciTech Forum and Exposition 2019, San Diego, USA
[Animesh Shashtry, Harsh Sinha and Mangal Kothari]

VISION-BASED AUTONOMOUS TRACKING AND LANDING OF A FULLY-ACTUATED ROTORCRAFT | Submitted to Control Engineering Practice, Journal Elsevier

MAJOR PROJECTS

- Clean Energy: ABU Robocon'16	Aug'15–Mar'16
- Ware-house Inventory Check through Quadrotors	Oct'17 –Dec'17
- Marker based Landing on Moving targets on a Tilt-Quad	Feb'18 - Oct'18
- Human Tracking and Following Quadrotor	Jan'18 - Apr'18
- Single Image Super Resolution via Sparse Representation	Jan'18 - Apr'18
- Autonomous Underwater Vehicle	Dec'14-Aug'15

ACHIEVEMENTS

2018		Placement Offer from ThoughtSpot.
2018	2nd, National	Satellite Imgae Segmentation, Inter-IIT Tech. Meet. (18 teams)
2018	5th, International	Intelligent Ground Vehicle Challenge, Michigan (36 teams)
2018	2nd, National	HUL Techspark, Mumbai (7 teams from IITs)
2017	3rd, National	Inter-IIT Technical Meet, IIT Madras (14 teams from IITs)
2017	93rd, National	ACM-ICPC Regional (3000+ teams)
2016	3rd, National	ABU Robocon, Pune (100+ teams)