SOURYA KOVVALI

Full-Stack Roboticist

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🌐 www.sourya.me

EDUCATION

MSc – Robotics, Systems & Control
ETH Zürich, Switzerland
Sep 2019 – present
5.05* /6

BTech – Mechanical Engineering
IIT Madras, India
Aug 2014 – May 2018
9.51 /10

SKILLS

Programming	Python, C/C++, HTML/CSS/JS/TS, MATLAB
Software & Tools	ROS, Docker, Jenkins, git, Flask, Svelte, Server management
CAD & 3D	Autodesk Fusion 360, Autodesk Inventor, Blender
Electronics	Jetson, Raspberry Pi and other SBCs, Arduino, ESP8266/ESP32

TECHNICAL PROJECTS

AMZ Driverless Racing 🔗

Lead, Software — *Sep 2020 – present*
- Developing 'AMZ Playground' – extensible web application for visualization, simulation, and analysis
- Overseeing software infrastructure, autonomous computer, and track-tools work packages

Core Member, Software Infrastructure — *Oct 2019 – Aug 2020*
- Developed 'amz-tool' to aid developers with updating dependencies, formatting, linting, and other functions
- Coordinated autonomous software development, maintained FSSIM (Formula Student Simulator)
- Setup and maintained self-hosted continuous integration (CI) servers for automated testing and feedback
- Designed and built ground truth mapping device (GTMD) to tag racetrack using Real-time kinematic (RTK) service

Team Anveshak - Mars Rover Design 🔗

Team Lead — *Jul 2017 – Jul 2018*
- Lead the team and represented at University Rover Challenge '17, Utah, USA - 29th among 82 teams globally
- Conducted crowdfunding campaign raising $2700 & networked with companies for sponsorship deals
- Initiated and lead the media team – responsible for video editing, graphic design, and web development

Technical Lead — *Feb 2016 – Jul 2017*
- Headed design of tele-operated robotic arm and gripper for rover with end-to-end design analysis (2017 – 18)
- Lead the chassis design and manufacturing for the first version of the rover – Aurora v1 (2017)

WORK EXPERIENCE

Skillveri Training Pvt. Ltd.

Intern, Product Design — *Jan 2018 – May 2018*
- Designed arc welding torch for VR simulator setup that utilizes retracting rod mechanism for electrode feed
- Integrated and programmed microcontroller for PID controlled retraction rate & IMU orientation feedback

Detect Technologies

Intern, Product Design — *Dec 2015 – Feb 2016*
- Ported thermal camera design to GoPro form-factor for fitting into existing gimbals on pipe inspection drones

RESEARCH EXPERIENCE

INDUS Lab, IIT Bombay

Research Assistant, Bipedal Robot Project   *Aug 2018 – Mar 2019*
- Designed and prototyped a pivoted bipedal test bench for conducting locomotion experiments
- Setup dynamic simulation environment in V-REP and planned transition from simulation to hardware

R2D2 Lab, IIT Madras

Undergraduate Researcher, Stance Control Orthosis Project   *Jun 2017 – Jul 2018*
- Implemented weight-activated knee-joint mechanism on prototype orthosis to achieve gait-based locking
- Performed FEA, fabricated entirely using stacked laser-cut profiles and load-tested multiple knee joints on UTM

Robotics Lab, IIT Madras

Undergraduate Researcher, GraspMan Mobile Manipulator Project   *Jan 2017 – Oct 2017*
- Designed dual-gripper redundant serial chain robot capable of locomotion, grasping and in-hand manipulation
- Experimented on grasping force for of various sizes and shapes to establish comparison metrics across grippers

PUBLICATIONS

[*Conf. Paper*]   Govindan, N., ***Kovvali, S. S. V.***, Chandrasekaran, K., & Thondiyath, A. (2018, May). **GraspMan-A Novel Robotic Platform with Grasping, Manipulation, and Multimodal Locomotion Capability**. In 2018 IEEE International Conference on Robotics and Automation (ICRA)(pp. 7354-7359). IEEE.

[*Patent - In Review*]   Nagamanikandan Govindan, ***Sai Sourya Varenya Kovvali***, Karthik Chandrasekaran, and Asokan Thondiyath, **'A versatile hybrid robotic system for multimodal locomotion and grasping'**, Application Number: 201841008257, filed on 06/03/2018

COURSE PROJECTS

ETH Zürich

151-0323-00 : Autonomous Mobility on Demand: From Car to Fleet
- Developed and deployed ROS packages of image processing and state estimation tasks on Duckiebot platform
- Applied basic machine learning to perform object detection and model learning tasks in Duckietown simulator

263-5806-00 : Computational Models of Motion
- Developed unified gait controller for both linear and angular DoF of body on a simulated hexapod robot

IIT Madras

ME6012 : Mechanics of Human Movement
- Processed motion capture and force plate date and performed Inverse-dynamics for analyzing various gaits

AM5011 : Virtual Reality Engineering
- Simulated kinesthetic sense of touching spherical surface using motorized articulating touch surface

COURSEWORK

Autonomous Mobility on Demand	Model Predictive Control	Computational Models of Motion
Autonomous Mobile Robots	Dynamic Prog. & Optimal Control	Vision Algorithms for Mobile Robotics
Intro. to Field and Service Robots	Digital Manufacturing	Machine Vision and its Applications