Jyotish P

hypothesis1996@gmail.com • jyotishp.com

Education

B. Tech. (Honors) and MS by Research in Electronics and Communications **Hyderabad, IN**
IIIT Hyderabad *2016 - 2020*

Master's Thesis: Motion planning under uncertainty **[PDF]**
Robotics Research Center (RRC), IIIT Hyderabad *Advisor: Dr. K. Madhava Krishna*
My thesis aims to understand various ways to navigate UAVs in complex environments under uncertainty. As a part of it, the collision avoidance and navigation problems are posed as a chance constraint optimizations (CCO). Various tractable solutions for CCO are explored. My thesis work was applied to a sponsored project from Collins Aerospace which demanded a robust motion planning algorithm for dynamic, uncertain environments with a positive feedback from the sponsors.

Work Experience

Industry

Engineering Lead - AIcrowd Feb 2021–Present
Technologies: Python, ML-Ops, DevOps, GitOps
- Responsible for the company wide infrastructure and services ranging from internal tools and public APIs for machine learning experiments, kubernetes clusters, CI/CD pipelines.
- Built evaluation platform that evaluated 110K ML solutions for various challenges hosted on AIcrowd with 99.95% SLA and organized multiple machine learning benchmark competitions.
- The evaluation platform leverages kubernetes APIs and is designed to scale by making each evaluation manage its own resources (using a mix of sidecars and service pods per evaluation).
- All the components are designed to be vendor neutral there by letting the company shift all or a part of its resources to any cloud provider or on-premises clusters.

Software Development Engineer - Swiggy Jul 2020–Jan 2021
Technologies: Go, Java, Spring
- Worked on high throughput data enrichment pipelines.
- Migrated a monolithic payments service to micro services based architecture.
- Built and deployed workflow manager for order payment life cycle management.
- Developed and integrated in-house DSL and query system for processing and querying payment rules.

Site Reliability Engineer - AIcrowd Nov 2019–Jan 2021
Technologies: Kubernetes, Argo, Docker, Python
- Built a machine learning solutions evaluation platform using Argo (a kubernetes native workflow manager).
- New challenges/competitions can be created easily by defining the specifications in a single file.
- Responsible for maintenance and deployment of company wide infrastructure and services.

Software Development Engineering Intern - Swiggy May 2019–Jul 2019
Technologies: Apache NiFi, Geomesa, Kubernetes, Docker, Scala, Java, Python
- Developed Redis NiFi plugin and ScyllaDB adaptor for existing GeoMesa NiFi plugins.
- Built and deployed a geo-data analysis platform using Apache NiFi, Geoserver, Kepler.gl.
- Developed a python bot to monitor git repositories for best practises validations and security vulnerability analysis as a part of engineering excellence initiative.

University

Systems Administrator - RRC, IIIT Hyderabad Mar 2018–Jun 2020
Technologies: OpenVZ, Docker, Kubernetes, LDAP, High Performance Computing, Python, Go
- Setup a highly available directory server using FreeIPA and Pacemaker.
- Aided the design of the centre's HPC cluster setup.

Undergraduate Research Assistant - RRC, IIIT Hyderabad May 2017–Jun 2020
Technologies: Optimization methods, Statistical inference, PyTorch, ROS, C++, Python
- Worked on developing different motion planning algorithms under uncertainty.
- As a part of research collaboration with Collins Aerospace, developed different navigation frameworks for fixed wing UAVs in urban environments.

Student Systems Administrator - IIIT Hyderabad May 2017–Oct 2019

Technologies: OpenVZ, Libvirt, LDAP, Proxy, Load balancer, Networks, Email Suites, DNS, Radius, Nagios

- Responsible for on-call, maintenance, deployment of campus-wide infrastructure and services.
- Custom auto-discovery and load balancing for domain wide web services that reverse proxies over 150 domains.
- Aided in building and deploying a transparent proxy using an SSL interception service that preserves the destination address as a domain name (so that the domain name based ACLs on parent proxy work) using SNI. This setup doesn't need a root CA installation on the clients.
- Setup hybrid mail routing between GSuite, Office 365 and on-prem mail servers. Built and deployed various web portals for managing network access for guests, course feedback system, mailing list archives, etc.

Publications

Journals

Sharada Mohanty, Jyotish Poonganam, Adrien Gaidon, Andrey Kolobov, Blake Wulfe, Dipam Chakraborty, Gražvydas Šemetulskis, João Schapke, Jonas Kubilius, Jurgis Pašukonis, Linas Klimas, Matthew Hausknecht, Patrick MacAlpine, Quang Nhat Tran, Thomas Tumiel, Xiaocheng Tang, Xinwei Chen, Christopher Hesse, Jacob Hilton, William Hebgen Guss, Sahika Genc, John Schulman, Karl Cobbe. *Measuring Sample Efficiency and Generalization in Reinforcement Learning Benchmarks: NeurIPS 2020 Procgen Benchmark*. Journal of Machine Learning Research **(JMLR 2021)**.

SriSai Naga Jyotish Poonganam*, Bharath Gopalakrishnan*, A. V. S. Sai Bhargav Kumar, Arun Kumar Singh, K. Madhava Krishna and Dinesh Manocha. *Reactive Navigation under Uncertainty through Hilbert Space Embedding of Probabilistic Velocity Obstacles*. IEEE Robotics and Automation Letters + IEEE International Conference on Robotics and Automation **(RA-L + ICRA 2020)**.

Conferences

Ishaan Khare, Jyotish Poonganam, Bharath Gopalakrishnan, K. Madhava Krishna. *Probabilistic Inverse Velocity Obstacle for Free Flying Quadrotors*. IEEE European Control Conference **(ECC 2021)**.

P. S. Naga Jyotish*, Yash Goel*, A. V. S. Sai Bhargav Kumar and K. Madhava Krishna. *PIVO: Probabilistic Inverse Velocity Obstacle for Navigation under Uncertainty.* IEEE International Conference on Robot and Human Interactive Communication **(Ro-MAN 2019)**.

P. S. Naga Jyotish*, Yash Goel*, A. V. S. Sai Bhargav Kumar and K. Madhava Krishna. *IVO: Inverse Velocity Obstacles for Real Time Navigation*. Advances in Robotics **(AIR 2019)**.

Selected Projects

Multi-objective de-novo molecular generation using Deep Reinforcement Learning [PDF]
Developed a system to generate a set of candidate drug molecules given a set of desired molecular properties like melting point, SA score, solubility, number of benzene rings. An RNN is used to generate valid SMILE sequences describing molecules while RL based optimization is used to bias the RNN to generate molecules with desired molecular properties.

Poisson Image Editor [GitHub]
Image editing tasks posed as optimization problem using differential equations and gradient fields.

Neural Captioning [GitHub]
Implemented the image captioning models from "Show and Tell" and "Show, Attend and Tell" both containing a CNN and LSTM. The latter model also implements attention before sending the input image features to the RNN.

Unrolling the Shutter [GitHub]
Implemented a Row-Column kernel based CNN for correcting the distortion caused due to rolling shutter of the camera from a single image. Tried to improve the results using appearance flow.

MISC

- Invited to Dean's Dinner 2017-18 (for academic excellence), 2018-2019 (for research excellence)
- Club Coordinator, Photography Club, IIIT Hyderabad 2017-2018
- Systems Administrator, Felicity 2018 2018
- Photographer, Media Team, IIIT Hyderabad 2016-2017