SriSai Naga **Jyotish** P

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Education

B. Tech. (Honors) and MS by Research in Electronics and Communications **Hyderabad, IN**
IIIT Hyderabad *Expected graduation: 2020*
CGPA: 7.92/10

Master's Thesis: Motion planning under non parametric uncertainty
Robotics Research Center (RRC), IIIT Hyderabad *Advisor: Dr. K. Madhava Krishna*
My thesis aims to understand various ways to plan trajectories for different robots under uncertainty. As a part of it, the collision avoidance navigation problem is posed as a chance constraint problem and different methods to solve chance constraints are explored and studied. My thesis work was applied to a sponsored project from Collins Aerospace which demanded a motion planning algorithm that incorporates state and perception uncertainty of the robot with positive feedback.

Research Interests

Reinforcement Learning • Optimal control • Motion planning • Computer Vision • Uncertainty Estimation

Publications

P. S. Naga Jyotish*, Bharath Gopalakrishnan*, Bhargav, 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 (RA-L) 2020 *(Accepted)*.

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.

Work Experience

Site Reliability Engineer - AIcrowd Nov 2019–Present
- Responsible for building, deploying and maintaining the pipelines for evaluating challenges at AIcrowd.
- These challenges can range from simple input-output based problems to complex reinforced learning problems.

Software Development Engineering Intern - Swiggy May 2019–July 2019
- Built a platform to drive engineering excellence at Swiggy.
- Built and deployed a sub-second latency geo-data analysis platform.

Undergraduate Research Assistant - RRC, IIIT Hyderabad May 2017–Present
- Worked on developing different motion planning algorithms under uncertainty.
- Developed different end-to-end navigation frameworks for holonomic agents.
- As a part of research collaboration with Collins Aerospace, developed a navigation framework for fixed wing UAVs in urban environments.

Student Systems Administrator - IIIT Hyderabad May 2017–August 2019
- Responsible for maintenance and deployment of institute-wide infrastructure and services serving ~3000 users.
- Available 24/7 on-call for all incident response and remediation.
- Automated server configuration for institute's reverse proxy server that serves over 150 domains.
- Deployed transparent proxy with SSL interception using SNI parsing.
- Mentored the next generation of student sysadmins.

Systems Administrator - RRC, IIIT Hyderabad Mar 2018–Present
Responsible for the maintenance and deployment of centre's high performance computing cluster. Also responsible the deployment and maintenance of the centre's website.

Projects

Notable 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.

Exploring Power Signatures for Location Forensics of Media Recordings
Developed a system for geographical location identification from electric network frequency signatures of power distribution networks in the media recordings using SVM.

Other Selected Projects

- **Pegasos-SVM** SVM classifier using PEGASOS algorithm. [GitHub]
- **Chord DHT** Distributed hash table using chord protocol written in Go. [GitHub]
- **IRC** Server-Client written in C++ with multiple chatrooms. [GitHub]
- **Transparent Proxy**, written in Go, that serves ~3000 users.
- **HTTP Proxy Server** written in Python with multi-threading.
- **Peer to Peer File Sync** A P2P file sharing and syncing client-server written in Python.
- **Autonomous Navigation of Quadrotors** using ROS.
- **Reactive obstacle avoidance with Quadrotors** using ROS.

Selected Coursework

- Advances in Robotics
- Communication Networks
- Computer Vision
- Digital Image Processing
- Distributed Systems
- Mobile Robotics
- OS and Algorithms
- Principles of Information Security
- Statistical Methods in AI

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

Skills

Advanced

Python • Shell • Linux System Administration

Intermediate

C/C++ • Go • JS • Ruby • PHP • MATLAB
Computer Vision • Machine Learning
ROS • Gazebo • OpenCV • Tensorflow • PyTorch
Docker • Libvirt • OpenVZ • LDAP • EMail Suites • Monitoring Tools • nodeJS • Slurm • Networking

Familiar

Lua • Unreal Engine • Rust • Java • Scala • Windows Administration