SriSai Naga Jyotish P

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Portfolio | Github

EDUCATION

International Institute of Information Technology, Hyderabad *Expected grad. 2020*
B.Tech. (Honors) + M.S. by Research in Electronics and Communications Engineering (Spl. Robotics) *Cumulative GPA: 7.92*

EXPERIENCE

Software Development Engineering Intern — Swiggy May '19 - Jul '19
Technologies: Kubernetes, Docker, Geomesa, Scylla DB, Redis, Apache NiFi, Kafka, Netflix Conductor, AWS

- Built and deployed a **sub-second latency geo-data analysis platform**.
- Built a platform to drive **engineering excellence** at Swiggy.

Student Systems Administrator — IIIT Hyderabad May '17 - Sep '19
Technologies: OpenVZ, Libvirt, LDAP, Proxy, Load balancer, Networks, Email Suites, DNS, Radius, Nagios

- Responsible for **on-call, maintenance and deployment of institute wide infrastructure and services** serving over 3000 users.
- Custom **auto-discovery and load balancer** (using nginx) of 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 are still valid) using SNI. This setup doesn't need a root CA.
- Migrated a part of Emails services (few sub-domains) to GSuite and 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.
- Built and deployed a plugin for generating custom reports for Redmine.
- Aided in migrating CAS, Free radius, DHCP and scaling squid web proxy.
- Involved in **mentoring the next generation** of student sysadmins.

Undergraduate Research Assistant — Robotics Research Centre - IIIT Hyderabad May '17 - Present
Technologies: Statistical inference, Optimization and optimal control, Uncertainty modeling, Deep learning

- Worked with Prof. Madhava Krishna on developing different **motion planning algorithms under uncertainty**.
- As a part of research collaboration with Collins Aerospace, developed an **end-to-end navigation framework** for fixed UAVs.

Systems Administrator — Robotics Research Centre - IIIT Hyderabad Feb '18 - Present
Technologies: OpenVZ, Docker, Icinga, Prometheus, Linux cgroups, DNS, LDAP

- Setup a **highly available directory server** using FreeIPA and Pacemaker.
- Aided the **design of the centre's HPC cluster** setup and deployed it. Also setup monitoring for the cluster using Prometheus.
- Responsible for the maintenance of the centre's website.

PROJECTS

Multi-Objective de-novo Molecular Generation using Deep Reinforcement Learning
Technologies: Deep Learning, PyTorch

- 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 molecules.

Internet Relay Chat
Technologies: C++, Socket Programming

- IRC Server-Client implemented in C++ with support for multiple chat rooms.

Chord DHT
Technologies: Go, Distributed Systems, Protobuf

- A distributed hash table using chord protocol. Implemented a distributed file server as a proof of concept.

Poisson Image Editor
Technologies: Python, Digital Image Processing, Differential Equations

- Built an image processing tool that can seamlessly blend two images. The image editing tasks are posed as an optimization problem using differential equations and gradient fields.

Neural Captioning
Technologies: Python, Keras, Deep Learning, Computer Vision, Natural Language Processing

- Built a tool that can generate captions for a given image input. 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.

HTTP Proxy Server
Technologies: Python, Socket Programming

- A multi-threaded program which proxies HTTP requests and forwards them.

Unrolling the shutter
Technologies: Python, Keras, Deep Learning, Computer Vision

- Built a tool that can undistort the distortions caused due to rolling shutter. 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.

Pegasos SVM
Technologies: Python, Optimization methods

- Implemented an SVM classier with custom update rules for training. The update rules were derived from PEGASOS algorithm.

Exploring Power Signatures for Location Forensics of Media Recordings
Technologies: MATLAB, Optimzation, SVM

- Developed a system for geographical location identification from electric network frequency signatures of power distribution networks in the media recordings using SVM.

TECHNICAL STRENGTHS

Languages	C/C++, Go, JavaScript, MATLAB, PHP, Python
Familiar with	Java, Lua, Ruby, Scala
Web Development Frameworks	Django, Flask, Laravel, Ruby on Rails
Software & Tools	Git, Shell, ROS, OpenCV, PyTorch, Keras, Unreal Engine

SELECTED COURSEWORK

Computer Science: OS and algorithms, Principles of Information Security, Distributed Systems, Communication Networks.

ML/AI and Optimization Methods: Statistical Methods in AI, Computer Vision, Optimization Methods, ML for Sciences, Mobile Robotics, Advances in Robotics.

Other Courses: Probability and Random Processes, Digital Image Processing, Digital Signal Processing, Linear Algebra, Estimation Theory, Game Design and Engineering, Analog and Digital Electronic Circuits.

PUBLICATIONS

(under review) **P. S. Naga Jyotish***, Bharath Gopalakrishnan, Bhargav Kumar, Arun Kumar Singh, Madhava Krishna and Dinesh Manocha. Reactive Navigation under Uncertainty through Hilbert Space Embedding of Probabilistic Velocity Obstacles.

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.

MISC

Invited to Deans dinner '18 (for academic excellence) and '19 (for research work).

Systems Administrator for Felicity '18, IIIT Hyderabad.

Coordinator for Photography Club, IIIT Hyderabad.

Photographer for Media team, IIIT Hyderabad.