Phani Krishna Penumarthi

Actively Searching for Summer Internships at Research Labs

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Research Experience

Multirobot Exploration for Building Communication Maps with Prior from Communication Models

Advisor: Prof. Srihari Nelakuditi — Sep'16-Mar'17

This project addresses the problem of building a communication map (RSSI) of a known physical environment using multiple robots. We utilized the known communication channel models as prior to the Gaussian Process, which determines the next set of destinations to the mobile robots.
Tools: ROS, Python, GPy

A Minimally Disruptive Design for an Elastic Cellular Core

Advisor: Prof. Samir R Das — Dec'14-Nov'15

Proposed KLEIN, a cellular core re-design that stays within the confines of current standards by leveraging NFV concepts. Our evaluations through data-driven simulations and real prototype experiments using OpenAirInterface show that KLEIN can scale to billion of devices. My contribution in this project is in developing an LTE software testbed for verifying the KLEIN architecture.
Tools: OpenAirInterface, Emulab, gdb, perl, bash.

On Sharing a Slot Among Mobiles Equipped with Multiple Antennas in WiMAX Networks

Advisor: Prof. SivaRam Murthy C — Sept'11-Jul'12

Analyzed the maximum number of mobiles that can share an OFDMA slot, given the rate requirements and available multiple antenna techniques at each mobile. Also studied several scheduling mechanisms for mobiles such that data rate requirements can be successfully maintained. Signal to Interference Ratio is used as the parameter to verify if a rate requirement is practicable.
Tools: MATLAB, Java, ns-3 Simulator.

Impact of MIMO Techniques in a WiMAX Network

Advisor: Prof. SivaRam Murthy C — Dec'09-Aug'11

Studied if ONE Multiple Input Multiple Output (MIMO) technique can fit for all channel conditions in a highly mobile network. And proposed a MIMO technique that exploits receiving data from one antenna of a mobile without errors. Observed that the proposed technique uses a non-optimal (zero forcing) receiver, and the performance enhancements observed in simulations are not practically possible in a real network.
Tools: MATLAB, ns-2 Simulator.

Professional Experience

Parsing GTP Packets in an Enterprise SDN Network

Internship at BigSwitch Networks — May'16-Aug'16

My role was to develop an LTE module in the flagship Big Monitoring Fabric product, that maintains mapping of the GTP Control and Data packets. This is to forward packets of different users to different tools that monitor the network out-of-bounds.
Tools: DPDK, C.

Vembu Technologies, Intel Technologies, and HCL Technologies

R&D Engineer — '13-'14, '12-'13, '07-'08

My contributions include: Developing Middleware for automatically Mounting a proprietary File System (that uses complex De-duplication techniques) on basic Windows/Linux Systems; Extracting NTFS specific metadata from raw/vmdk/vhd disk images on Linux based Systems;
Developing proof of concepts & Middleware for enabling new functionalities on Android Kernel; Development & testing for End-to-End functionality for WiFi-3G data offloading;
Maintenance and Performance Enhancements of LoanIQ product at Deutsche Bank.
Tools: bash, VC++, ADK, git, gdb, Sybase, MongoDB.

Education

2014–Now — **University of South Carolina**
Ph.D Candidate & ITA in CSE
Advisor: Prof. Srihari Nelakuditi, Prof. Samir R Das at ***StonyBrook University*** *(2014 – 2015)*

2009–12 — **Indian Institute of Technology, Madras**
Master of Science by Research in CSE
Advisor: Prof. SivaRam Murthy C

2003–07 — **Koneru Lakshmaiah University**
Bachelor of Technology in Electronics and Computer Engineering

Software Skills

Good level	**C**, Java, OpenAirInterface, OpenEPC, Perl, **Python**, Linux, Emulab
Intermediate	SQL, **git**, gdb, OpenVSwitch, ROS, Floodlight Controller, Android Kernel Development, MATLAB
Basic level	Windows, VC++, JOS

Publications

2017 — **P. Phani Krishna**, Alberto Quattrini Li, Jacopo Banfi, Nicola Basilico, Francesco Amigoni, Jason OKane, Ioannis Rekleitis, and Srihari Nelakuditi
Multirobot Exploration for Building Communication Maps with Prior from Communication Models, To Appear at IEEE MRS, 2017

2017 — Glenn Robertson, Nirupam Roy, **P. Phani Krishna**, Srihari Nelakuditi, Jason M. O'Kane
Loop-Free Convergence with Unordered Updates, IEEE Transaction on Network and Service Management, Feb 2017

2016 — Zafar Ayyub Qazi, **P. Phani Krishna**, Vyas Sekar, Vijay Gopalakrishnan, Kaustubh Joshi, Samir Das
KLEIN: A Minimally Disruptive Design for an Elastic Cellular Core, to appear at ACM SOSR'16.

2012 — **P. Phani Krishna** and C. Siva Ram Murthy
On Bounding the Number of Mobiles Sharing a Slot in a Point-to-Multi-point Network, in Proceedings of ACM MSWiM'12, 247-252.

2012 — **P. Phani Krishna**, R. Saravana Manickam and C. Siva Ram Murthy
MIMO Enabled Efficient Mapping of Data in WiMAX Networks, in proceedings of Springer ICDCN'12, 397-408.

Ongoing Research Projects

1 On Using communication maps for choosing waypoints to drones
Our previous work for MRS was based on turtlebot robots. This is an extension of that work to drones.

2 On fine grained power profiling of drones
Determining the power consumed by each device on a drone. Clearly, motors consume most of the power. This work is catered to optimize the remaining devices power so that the drone flying time can be improved.