TEJASHRI KUBER

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Summary: PhD candidate looking for full-time opportunities in the areas of Wireless Communication, Signal Processing and Machine Learning

EDUCATION

Doctor of Philosophy   **Expected Sep 2020**
Thesis topic: Prediction and Learning in Wireless Systems
Dept. of Electrical and Computer Engineering
Wireless Information Network Laboratory (WINLAB)-North Brunswick, Rutgers University, NJ-USA
Advisors: Prof. Narayan Mandayam, Ivan Seskar

Master of Science   May 2013
Thesis topic: Automatic Modulation Recognition Using Discrete Wavelet Transforms
Dept. of Electrical and Computer Engineering
Rutgers University, New Brunswick, NJ-USA
Advisor: Prof. David Daut

Bachelor of Engineering   Jun 2010
Electronics and Communication Engineering
Visvesvaraya Technological University, Bangalore - India

RESEARCH EXPERIENCE

Graduate Assistant, WINLAB, Rutgers, NJ   Jan 2016-present
- Used deep learning techniques such as recurrent neural networks (RNNs), specifically long short term memory (LSTM) modules to model cellular traffic behavior. In addition to temporal analysis, spatial correlation and other auxiliary elements were included to improve the prediction analysis
- Used k-means clustering and k nearest neighbor machine learning (ML) approaches to classify raw MIMO wireless signals
- Predicted channel variation using multi-class classification trees with channel state information to improve overall system throughput
- Implemented the 802.11ac MU-MIMO testbed using USRPs on Open-Access Research Testbed for Next-Generation Wireless Networks (ORBIT), for real-time data collection and used MATLAB for offline processing to study the behavior and advantages of MU-MIMO
- Measured the parameters and observed the characteristics of different spectral distributions in NC-OFDM and other transmission technologies, to model trade-offs in power and channel bandwidth
- Created the Simulink signal-processing blocks for the OFDM transceiver application to be used for the hardware implementation of NC-OFDM on ORBIT

Research Assistant, WINLAB, Rutgers, NJ   Jun 2013-Aug 2015
- Used the in-house Software-Defined Radio (Cognitive Radio Kit) to create applications for digital communication systems using Xilinx System Generator
- Assisted in the build and validation of cognitive radio architecture components, such as Memory Management Unit (MMU) driver, Buffer Management Unit (BMU) monitor
- Designed an Automatic Gain Controller for a PSK transceiver system for the cognitive radio framework

PUBLICATIONS

- **Kuber, T.,** Saha, D., & Seskar, I. (2019, September). Blind Classification of MIMO Wireless Signals. In *2019 IEEE 90th Vehicular Technology Conference (VTC2019-Fall)* (pp. 1-5). IEEE.
- **Kuber, T.,** Saha, D., & Seskar, I. (2018, July). Predicting Channel Transition for MU-MIMO Beamforming. In *2018 IEEE 5G World Forum (5GWF) (pp. 83-88).* IEEE.
- **Kuber, T.,** Sridharan, G., Saha, D., & Seskar, I. (2017, May). Practical MU-MIMO experiments using SDRs. In *2017 IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPS) (pp. 517-522).* IEEE.
- Kumbhkar, R., **Kuber, T.,** Sridharan, G., Narayan, B., & Seskar, I. (2015, September). Opportunistic spectrum allocation for max-min rate in NC-OFDMA. In *2015 IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN) (pp. 385-391).* IEEE.

Master's Thesis   Jun 2011-Jan 2013

- Designed an algorithm to improve the radio receiver performance by including a system to identify the modulation scheme of the transmitted signal and then decode and demodulate radio-frequency (RF) modulated signals. Simulated and validated the algorithm using MATLAB

Indian Space Research Organization, Bangalore – INDIA   Jun 2009-Jun 2010

- Designed the encoder and decoder for Convolution Codes using Viterbi algorithm and improved the decoder design by adding memory, and tested the design on an FPGA using VHDL
- Evaluated the performance of LDPC codes for short length messages as against Convolutional Codes and Turbo Codes using MATLAB

WORK EXPERIENCE

HDL Code Generation Intern, The MathWorks, Natick, MA   Sep 2015-Dec 2015

- Designed and created a prototype for high-performance platforms which allow algorithms from MATLAB and Simulink to work on FPGAs.
- Developed and synthesized arithmetic, logical and trigonometric operators for IEEE-754 single-precision floating-point inputs, with timing, latency and post-route area constraints.
- Created testbench scripts to rigorously verify all the boundary and exception conditions of the synthesized operators.

Teaching assistant, Linear Systems and Signals   Sep 2018-Dec 2018

Rutgers University - School of Engineering

- Taught the recitation class that focused on solving real-life linear systems problems for 50 undergraduate students

Teaching assistant, Introduction to MATLAB   Sep 2012-Dec 2012

Rutgers University - School of Engineering

- Taught the recitation class, assisted in designing assignments and consulted on programming problems in the practical hands-on computer sessions for 90 undergraduate students

SAT Math Tutor   Jan 2011-Jun 2012

- Prepared comprehensive assignments, examinations and tutored more than 20 students in SAT Math to apply the best methodologies for tackling each topic on the SAT

TECHNICAL SKILLS

- MATLAB: Communication, Wavelet, HDLCoder, WLAN Toolbox, Simulink
- Python: Keras, TensorFlow, Scikit-learn