

SURYA TEJA PARUCHURI**CONTACT**

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<https://stparuchuri.github.io/>**EDUCATION****University of Maryland**, College Park, MD.*Master of Science in Telecommunications*

GPA: 3.83/4.0.

May 2017

*Scholarly Paper: "Spectrum Efficiency: Using Full Duplex Techniques and Cognitive Radios."**Honors: Awarded Academic Excellence Scholarship, Nominated for Distinguished Student Award.***Vellore Institute of Technology**, Vellore, India.*Bachelor of Technology in Electronics and Communication Engineering*

GPA: 8.35/10

May 2014

*Senior Design Project: Radar Target Simulator.***CONTINUING EDUCATION****University of California, Irvine** - Division of Continuing Education.

- FPGA Design Fundamentals (A+).
- Real Time Embedded Digital Signal Processing (A-).

RESEARCH INTERESTS

- ❖ Signal Processing and Communications
- ❖ Applied Mathematics.

PUBLICATIONS

- E. E. Tsiropoulou, A. Thanou, **S.T. Paruchuri**, and S. Papavassiliou, "Self-organizing Museum Visitor Communities: A Participatory Action Research based Approach", *12th International Workshop on Semantic and Social Media Adaptation and Personalization (SMAP 2017)*, Bratislava, Slovakia, July, 2017.
- E.E.Tsiropoulou, **S.T. Paruchuri** and J.S. Baras, "Interest, Energy and Physical-Aware Coalitions Formation and Resource Allocation in Smart IoT Applications", *51st Conference on Information Sciences and Systems (CISS 2017)*, Johns Hopkins University, Baltimore, MD, 2017.
- H. Dagale, S. V. R. Anand, M. Hegde, N. Purohit, M. K. Supreeth, G. S. Gill, V. Ramya, A. Shastry, S. Narasimman, Y. S. Lohith, and **P. Surya**, "CyPhyS+: A Reliable and Managed Cyber-Physical System for Old-Age Home Healthcare over a 6LoWPAN Using Wearable Motes," in *2015 IEEE International Conference on Services Computing (SCC)*, 2015, pp. 309 - 316.

RESEARCH AND TEACHING EXPERIENCE**Voluntary Research Assistant, University of Maryland**

November 2016 – May 2017

- Assisted Institute for Systems Research post-doctoral candidate, by implementing and numerically verifying against analytical solutions a "resource allocation algorithms for Internet of Things" and a "coalition formation algorithms for self-organizing museum visitors", in MATLAB.
- Co-authored two conference paper presented at *51st Conference on Information Sciences and Systems*, Baltimore, Maryland, 2017 and *The 12th International Workshop on Semantic and Social Media Adaptation and Personalization (SMAP 2017)*, Bratislava, Slovakia, July, 2017.

Teaching Assistant, University of Maryland

September 2016 – May 2017

- Assisted instructor on teaching multiple sessions of junior level course on Operations Research, by resolving students' questions, grading weekly homework, term exams and organizing make-up exams.
- Mentoring enhanced my teaching and knowledge transfer skills.

Project Assistant, ECE, Indian Institute of Science, India

June 2014 – May 2015

- Developed a Fuzzy Logic based medical diagnosis algorithm for "*6LowPAN based Cyber Physical System for remote health monitoring*" - to assess patient's health.
- Implemented a simple statistical signal processing algorithm for QRS detection in ECG and improved heart anomalies detection and reduced complexity significantly compared to Pan Tompkins and Wavelet based beat classification algorithms.
- Expedited deployment and field testing of Wireless Sensor Network (WSN) by accelerating the debugging process of the server side socket code to prevent data misinterpretation.
- Co-authored a conference paper presented at **12th IEEE International Conference on Services Computing**, New York, 2015, and presented the project during Indian Institute of Science's Open Day 2015.

WORK EXPERIENCE**Embedded Engineer, Spirent Communications Inc Eatontown NJ**

May 2018 - Present

- Improved Lognormal fading DSP firmware performance on TMS320C6678 by x3.84 (389,000 to 101,000 cycles) using processor intrinsics, reducing loop carried bound and software pipelining (out of order assembly execution).
- Designed, implemented and delivered 3GPP High Speed Train Channel model DSP firmware on TMS320C6678.
- Designed Vertex's dynamic rate-conversion sub-system to support arbitrary scaling of fading Doppler signals to an accuracy of 0.1 Hz using multi-rate filter banks in MATLAB. (Implementation in C++ is in progress).
- Lead a team of 2 Software Developers to deliver 2 major releases of Spirent's Live2Lab product – for 5G NR.
- Implemented new processing engine's routines for 5G NR Over-The-Air Testing of MIMO gNodeB in C#.
- Translated product manager's requirements to design specifications, project timeline, Test cases, and finally Product Documentation.
- Accelerated DSP firmware and Live2Lab build generation by setting Continuous Integration system using Ant Build, Jenkins and Perforce.
- Supported DSP command parsing performance improvement by bringing Core 7 on TMS320c6678 using sysBIOS.
- Accelerated delivery of Vertex's 4.50, 4.60 and 4.70 release by verifying statistical properties of fading Signal.
- Integrated dynamic phase shift and bulk delay firmware with software to generate frequency selective fading.

Wireless Engineering Intern, Skylark Wireless LLC. Houston TX

November 2017 – May 2018

- Improved Iris's SFDR by 28.571% (9.52 dBc) by implementing self-calibration firmware to mitigate LO Feed Through, DC Offset and IQ impairments of LMS7002M --2X2 MIMO RFIC, using Python SWIG, SoapySDR and C++.
- Implemented a DOCSIS 3.1 to UHF Band Upstream Up conversion using LMS7002EVB and demoed to a client.
- Assisted in Iris software defined radio (SDR) Rx Sensitivity tests by setting up synchronized Iris SDR test-setup.
- Performed Quality Assurance-power sequence tests on 112 Iris-SDRs to characterize inrush current on Iris SDRs.
- Made a Raspberrypi image to remotely power cycle Base Station power boxes (inaccessible after installation).
- Recommended Microsoft Air Band Grant Initiative to raise a capital of \$75000 for the start-up.

Web Developer, Institute for Systems Research, University of Maryland

June 2016 – May 2017

- Developed Professor's website to organize over 750+ research papers, numerous honors and awards, courses, research project details etc., using Drupal CMS framework on a remote servers.
- The website currently serves as a central digital repository, and eliminated need to maintain different spreadsheets.

Engineering Intern, Defense R&D Organization, India

January 2014 – May 2014

- Designed Radar Target Simulator (RTS) using Digital Radio Frequency Memory & real time signal processing algorithms for hardware in the loop testing of Active Antenna Array Unit (AAAU) & Primary Radar (PR).
- RTS significantly reduces testing costs through ground based testing compared to mid-air testing process.
- Assisted in testing of modulation module based on Error Vector Magnitude (EVM) enhanced subject knowledge.

Engineering Training, Electronics Corporation of Indian Limited (ECIL), India

June 2013

- Mastered instrument calibrations process through hands-on training on calibration of electronic radioactive detectors using Cesium (Cs) and Potassium (K-40) isotope samples.

ACHIEVEMENTS & AWARDS

- Selected for final round for Data Science Fellowship by The Data Incubator/Cornell Tech. (<2% selectivity across US), November 2017.
- Telecommunication's Academic Scholarship, for excellence in academics, February 2017.
- Nominated for Telecommunication's Distinguished Student Award, December 2016.

PROFESSIONAL AFFILIATIONS:

- Student Member, Institute of Electrical and Electronics Engineers (IEEE), (since Feb'12).
- Student Member, Society for Industrial and Applied Mathematics (SIAM), (since August'16).

SKILLS

- *Programming languages:* MATLAB, C, C++, C#, Python, Bash, Assembly, VHDL, Javascript.
- *Tools & Libraries:* Vivado, CCStudio, SysBIOS, numpy, SoapySDR, GNU Radio, PyQt5.
- *Lab Equipment:* Spectrum Analyzers, Network Analyzers, O'scopes, Signal Generators.
- *Typesetting & Productivity:* LaTeX, VIM, Git, Perforce, GDB, SWIG, make, CMake, Jenkins, Ant Build.

SERVICE

Vice president, IEEE Electron Devices Society-VIT, VIT University, Vellore, India

May 2012 – July 2013

- Supervised and budgeted guest lectures by renowned professors in Nano/Quantum electronics and National workshops to bolster awareness on Nano Sciences. Determined chapter's events and advertised to increase chapter's membership by 30%.

SELF-PUBLISHED ARTICLES (REF: terpconnect.umd.edu/~surya)

- S. T. Paruchuri, "Spectrum Efficiency: Using Full Duplex Techniques and Cognitive Radios". April 2017.
- S. T. Paruchuri, "Bluetooth: A Brief Note on Technology", Feb, 2016.
- S. T. Paruchuri, "A brief survey paper on WSN usage for flood detection and forecasting", November 2013.

SELECTED PROJECTS

Extending Texas Instruments RTOS, University of Maryland

Spring 2017

- Mastered multi-threaded programming in a commercial Real-Time Operating System (RTOS) by implementing a multi-threaded LIFO buffer in C for MSP430F5529 microcontroller.
- Synchronization in shared memory (Producer-Consumer model) is achieved through mutex locks.

RTOS Scheduler Simulations, University of Maryland

Spring 2017

- Mastered discrete event simulation by implementing Real-Time Operating System scheduler simulator for FIFO, Earliest deadline First (EDF) and Rate Monotonic Scheduling (RMS) in C++, using C++ Standard Template Library.

OFDM Tx/RX chain with Rayleigh fading channel, University of Maryland.

Spring- 2016

- Implemented an OFDM transmitter with LTE (R'10) sub-frame based QPSK modulated pilots & 16QAM modulated data, along with cyclic prefix, transmit filters, Rayleigh fading channel and an OFDM receiver with zero-forcing equalizer in MATLAB.
- Observed advantages of an OFDM system in a fading channel over complex equalization techniques using BER as a measure by varying SNR.

A Number Plate Recognition Algorithm, VIT University

March -- May 2013

- Implemented individually a number plate recognition algorithm based on correlation of the segmented connected areas and custom built character templates and tested in MATLAB® to have hands-on learning about Digital Image Processing.

An Algorithm for Suppression of Nonstationary Noise in Voice Signals using Kalman filter, VIT University

July – October 2012

- Implemented with a fellow student an algorithm for suppression of Nonstationary noise in voice signals using Kalman Filter based Predictor technique and tested on real life voice in MATLAB® to gain deep understanding in Digital Signal Processing.