

# Nirmala Sreeram

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## Summary:

Seeking full-time position in the field of Software/System development. Experience includes developing product solutions applying signal processing, algorithm development, simulation, software development and validation. Data driven and primary focus is to deliver a product meeting quality and process guidelines.

## Education:

### Masters in Electrical Engineering

2013-2020

Virginia Polytechnic Institute and State University, Blacksburg, VA

Specialization: Wireless Communications, Networking CGPA: 3.36/4

\*Medical Treatment in India from 2015-2016

### Bachelors in Electronics and Communications Engineering

2007-2011

Anna University, India (University Rank Holder) CGPA: 3.9/4

### Udemy

2021

5G Mobile Networks: Modern Wireless Communication

## Masters Thesis: Virginia Tech

January 2018-Dec 2020

### Antenna Measurement Pattern in Time Domain Gating:

May 2020-Dec 2020

- Examined the parameters such as required range and frequency spacing to achieve a given spatial resolution in antenna pattern measurements.
- Analyzed the duration of each antenna measurement in time domain across various signal amplitudes and angles.
- Studied the effects of time-domain processing on pattern measurement accuracy like comparing antenna pattern measured in multipath environment against pattern measured in an ideal environment with no reflections.
- Analyzed the effect of time-domain windowing function used to remove the reflections in antenna pattern.

### Orthogonal Frequency Division Multiplexing (OFDM) Communication Systems: January 2018-April 2020

- Performed an extensive analysis on OFDM wireless communication systems. OFDM is a modulation technique used in 802.11 family to transmit digital data over multiple carriers.
- Identified the advantages of using OFDM for high-speed digital communications, analysing signal properties including bandwidth efficiency, robustness to channel fading and equalization factor.
- Developed a system architecture that allows subcarriers of OFDM signals to be phase modulated individually.
- Implemented algorithms for signal modulation techniques in Matlab.
- OFDM systems pose a high peak to average power ratio (PAPR) that leads to operating linear power amplifiers with large power back-offs.
- Benefits of this design included reduction of PAPR value from that of a conventional OFDM design through non-linear amplification of phase-modulated signals.

## Academic Projects: Virginia Tech

### Radio Frequency: Vehicular Communications (V2X:V2V& V2I)

August 2017- December 2017

- Conducted research on Vehicular communication comprising of mmWave & DSRC systems.
- Researched the potential of mmWave communication and identified this technology to be more suited for V2I applications.
- Analyzed the DSRC System, studied the sparse interference around 5.9 GHz and system's ability to separate channels suitable for V2V applications.

- Studied the efforts to set-up a DSRC and mmWave communication system by analyzing performance metrics such as latency and bandwidth.
- Summarized the drawbacks of DSRC and mmWave such as shadow fading, multi path delay, Doppler Shift and angular spread that causes signal attenuation.
- Studied the CAN architecture and application of V2X communication across several ECUs in vehicles.

#### **Bluetooth:**

August 2017-December 2017

- Researched on the various Bluetooth profiles (SPP, HSP, HID & A2DP) and their applications.
- Studied the BLE stack architecture and protocols-L2CAP and ATT including GATT and GAP profiles.
- Analyzed the SIG Bluetooth v4.0 and BLE for their range, data rates and power. BLE introduces reduction in power consumption, aimed at devices that does not require high data rate nor constant transmission.

#### **System and Software Security: (*Mobile OS Detection/Fingerprinting*)**

January 2017-May 2017

- Goal of this project was to identify the OS type and software version in cell phone devices. Collected encrypted network information from cell phone devices (training data), operating on various versions of Android and iOS systems using Wireshark tool.
- Analyzed these data sets and created templates based on each OS software version. Introduced test data against this template and validated the identification model.
- Machine learning was carried out in the frequency domain to improve efficiency and obfuscation was introduced as a counter measure to prevent data accessibility.

### **Work Experience:**

#### **Virginia Tech**

##### **Graduate Student Grader:**

August 2013-May 2014

- Grader for courses: Applied Electrical Theory, Industrial Electronics and Stochastic Signals & Systems.

##### **Graduate Teaching Assistant:**

January 2013-May 2013

- Mentored Bachelors students with lecture materials in communication systems and solved their engineering doubts.
- Evaluated assignments and helped Bachelors engineering students to understand concepts of Signal Processing.

#### **Tata Consultancy Services, Ltd., Chennai, India**

November 2011-December 2012

##### **Assistant Systems Engineer:**

- Worked on an insurance project for an UK based customer as the primary customer point of contact.
- Developed software using agile methodology, carried out code review/optimization and carried out software compilation.
- Created test requirements and collaborated with the validation team to come up with defined pass/fail criteria.
- Prepared technical presentations explaining the software logic aligning with requirements.
- Participated in internal backlog meetings and report software development timelines to the Project management team. Participated in software quality audits for customer release.
- Documented software test and validation requirements as per SDLC guidelines.

#### **Skillset:**

TCP/IP Network Protocols | Wireless Standards | Digital Signal Processing | LTE | OTA | Data Analytics | Bluetooth | CAN Architecture |

- **Programming Languages:** C, C++, VHDL.
- **Office Tools:** MS Excel, MS Word, MS PowerPoint, MS Visio.
- **Simulation Tools:** Matlab, Simulink
- **Data Analysis Tools:** JMP, Wireshark