Abhinav ANAND
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Education

- **Birla Institute of Technology and Science, Pilani** — Hyderabad, India
  Bachelor of Engineering in Electrical and Electronics; GPA: 8.21/10 — *Jul. 2016 – Jul. 2020*

Manuscripts

- **A. Anand**, R. Chopra and C.R. Murthy, "Impact of User Mobility on the Downlink Performance of Cell-Free Massive MIMO Systems", *in preparation*
- **A. Anand** and C.R. Murthy, "Impact of Subcarrier Allocation and User Mobility on the Uplink Performance of Multi-User Massive MIMO-OFDM Systems", *submitted to IEEE Transactions on Communications* [arXiV]

Research Experience

- **Project Assistant, Indian Institute of Science** — Bengaluru, India
  Advisor: Dr. Chandra R. Murthy, Professor, Dept. of ECE — *Aug. 2020 – present*
  - Investigated the impact of channel aging and pilot contamination on the downlink performance of cell-free massive MIMO systems. Compared the achievable rates obtained via downlink training and statistical-CSI based decoding. Joint work with Prof. Ribhu Chopra at IIT Guwahati and Prof. Chandra at IISc.

- **Research Intern, Indian Institute of Science** — Bengaluru, India
  Advisor: Dr. Chandra R. Murthy, Professor, Dept. of ECE — *Jan. 2020 – Jul. 2020*
  - Analyzed the impact of inter subcarrier interference (ICI) and channel aging on the uplink sum-rate of massive MIMO-OFDM systems for two receive combining schemes: maximum-ratio (MR) and zero-forcing (ZF). In addition, formulated a simple but effective subcarrier allocation rule to maximize the sum-rate performance.

- **Summer Intern, 5G Testbed Project, IISc** — Bengaluru, India
  PI: Dr. Chandra R. Murthy, Professor, Dept. of ECE — *May 2019 – Jul. 2019*
  - Conducted the downlink interoperability test of OpenAirInterface (OAI) 5G NR stack for 3 channels, namely PBCH, PDCCH and PDSCH. The setup consisted of a USRP (X310), a VSA (Keysight N9020B) and a VSG (Keysight N5182B). Made extensive use of 3GPP TS 38.211 document to decode the channels.

- **Summer Intern, Defence R&D Organization (DRDO)** — Hyderabad, India
  Guide: Mr. Nilang Trivedi, Scientist, Research Centre Imarat (RCI) — *May 2018 – Jul. 2018*
  - Programmed an ADC-FPGA interface to acquire analog input from a signal generator (Keysight E8267D) and display its power spectrum in real time on Xilinx Vivado. The spectrum data helped us infer the Signal-to-Noise Ratio (SNR) and the Spurious Free Dynamic Range (SFDR) of the ADC (AD9269).

Course Projects

- **Comparative Study & Implementation of Spectrum Estimation Techniques**
  Guide: Dr. Shaikshavali Chitraganti, Assistant Professor (now at IIT Palakkad) — *Aug. 2018 - Nov. 2018*
  - Implemented the Bartlett's method and the Welch's method of estimating PSD of a stationary random process in MATLAB. Analyzed the bias, variance and resolution of the periodogram estimates, and compared the efficacy of the two algorithms.

Relevant Coursework

Signals and Systems, Digital Signal Processing, Control Systems, Modern Control Systems, Communication Systems, Advanced Digital Signal Processing (graduate-level), Linear Algebra (MATH F112), Differential Equations (MATH F211), Probability and Statistics, Optimization, FPGA-based System Design Lab

Academic Outreach

- **Teaching Assistantship:** Served as undergraduate TA for *Control Systems (EEE F242)* during Spring 2019 for Prof. Alivelu Parimi. Work involved preparing tutorial problems and conducting doubt-clarification sessions.
- **NPTEL Course Curation:** Curated 4 lecture videos of *Matrix Theory (E2 212)* taught by Prof. Chandra Murthy at IISc for publication on NPTEL, India's massive online learning platform. These videos may be found here.

Technical Skills

- MATLAB, LaTeX