

DEEPTHI GORTHI

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EDUCATION

Ph.D. Astronomy GPA: 4.0/4.0

University of California, Berkeley

📅 August 2015 – May 2021 (Expected)

B.E. (Hons.) Electronics GPA: 9.5/10

Birla Institute of Technology and Science, Pilani

📅 August 2010 – May 2015

M.Sc. Physics GPA: 9.5/10

Birla Institute of Technology and Science, Pilani

📅 August 2010 – May 2015

TECHNICAL EXPERIENCE

CPU Ring-Buffer based File Writing Pipeline

📅 Jan 2019 – Present

📍 UC Berkeley, CA

- Created a multi-threaded pipeline in C, that collects 33 Gbps UDP packets and processes them on Nvidia GPU cards ultimately writing the data to a RAID disk system
- Leveraged packet sockets, shared memory and semaphores to create HDF5-based files with dynamic headers

Xilinx® Vivado™ based FPGA Design

📅 August 2016 – August 2018

📍 UC Berkeley, CA

- Designed the signal processing pipeline for an interferometer with 350 antennas, each receiving 250 MHz using CASPER tools
- FPGA Design implements phase switching, fringe stopping and a polyphase filterbank that performs 8192-point FFT.
- Created a Python-based interface to FPGA for dynamically changing design parameters

Voltage Recorder for Radio Antennas

📅 May 2016 – January 2018

📍 UC Berkeley, CA

- Designed, constructed and deployed FPGA-based signal processing pipeline to collect voltage data
- Augmented with C-based software pipeline to write data to disk and Python-based tools to analyse the data

RESEARCH EXPERIENCE

Calibration Techniques for Large Phased Arrays

📅 Jan 2018 – Present

📍 UC Berkeley, CA

Invented two calibration schemes that scale as $O(N \log_2 N)$ for phased arrays by applying **linear algebra principles, statistical analysis and running simulations in Python**

SKILLS

C Python (Numpy, Scipy, Matplotlib) Linux Git
Simulink Vivado pyCUDA Cython Intel IPP

Linear Algebra, Statistical Analysis, MCMC Fitting, Computer Networks, Digital Signal Processing

AWARDS

- Outstanding Graduate Student Instructor, UC Berkeley
- Allan and Kathleen Gateway Fellowship, UC Berkeley
- Best Outgoing Student of Physics Department, BITS Pilani
- Merit Scholarship for top 0.1% of class, BITS Pilani
- DAAD Scholarship by the German Academic Exchange Service

LEADERSHIP

- Graduate Instructor for four different courses over two years (>200 students)
- Developed curriculum and created [Python-based tools for a lab course](#)
- Head, Outreach Programs at UC Berkeley Astronomy— gave **multiple public talks** about on-going research work, organized students for scientific outreach programs

CONFERENCES

- Hydrogen Epoch of Reionization Array Collaboration **University of Cambridge (2019)**
- Collaboration for Astronomy Signal Processing and Electronics Research **Harvard (2019), CalTech (2017)**
- National Radio Science Meeting (USNC-URSI) **University of Colorado, Boulder (2018)**

PUBLICATIONS

- Gorthi, Deepthi, Jack Hickish, et al. (2020). "FX-Correlator and Data Collection Pipeline for the Hydrogen Epoch of Reionization Array". In preparation.
- Gorthi, Deepthi, Aaron R. Parsons, and Joshua S. Dillon (2020). "Calibration Techniques with $O(N \log_2 N)$ Scaling for Large-N Radio Interferometers Built on a Regular Grid". In preparation.