Sathwik Gowripedda Sundaresh Email : sathwikgs97@gmail.com

Education

- National Institute of Technology Karnataka, Surathkal (NITK) *2015-2019*
  Bachelor of Technology in Electronics and Communication Engineering GPA: 8.76/10
- P. Obul Reddy Public School, Hyderabad *2013-2015*
  Senior High School 96.8%

Areas of Interest

- Hardware - Software Codesign, Computer Architecture, ASIC, VLSI Architectures for Signal Processing

Experience

- Qualcomm *Bangalore*
  Hardware Engineer Jul 2019 - Present
  - Pre-silicon verification of Qualcomm Hexagon DSPs, Security IPs and 5G ORAN subsystem
  - Developed scalable verification environment
  - Implemented formal verification methodologies to accelerate and enable early bug identification
  - Experience with Unified Power Format (UPF) bound Power-Aware RTL verification
- Digital Signal Processing Lab *NITK*
  Undergraduate Research - Prof. Sumam David S Fall 2018 - Spring 2019
  - Explored 3D Audio Processing
  - Audio samples collected using Data Acquisition System and MEMS Microphones for MATLAB modeling
  - Developed RTL design to realize 3D sound effects in real-time using microphone-array and time varying FIR filters
  - Verified functionality on Xilinx-Nexys4 DDR FPGA board
- Qualcomm *Bangalore*
  Intern - Software Engineer Summer 2018
  - Worked with WLAN Software team on characterizing signal interferences within IEEE 802.11 network
  - Developed MATLAB/Octave utilities to analyse WiFi spectrum
  - Generated visual aids to understand the properties of signal interference
  - Enhanced device drivers of WiFi routers to analyse the spectrum on-the-fly
- Indian Institute of Science *Bangalore*
  Research Intern - Embedded Systems Summer 2017
  - Worked under the guidance of Prof. G R Jayanth on Laser-based optical vehicle classifiers, a project which classifies vehicle based on a laser-microcontroller system - Deployed in wildlife areas for monitoring
  - ATMega328p microcontroller programming to classify vehicles based on laser beam sensor data
  - Designed an analog RC Filter circuit to improve the system's precision under bright sunlight

Publications

- GS, Sathwik and Acharya, Barun Kumar and Ali, Bilal and S. P., Deepu and David S., Sumam, "Real-Time Hardware Implementation of 3D Sound Synthesis," 2020 IEEE Asia Pacific Conference on Circuits and Systems (APCCAS), 2020, pp. 232-235 - (Link)

Academic Projects

- Real-Time 3D Sound Realization Fall 2018 - Spring 2019
  - Efficient ASIC design to realize 3D sound effects in real-time using microphone-array and time varying FIR filters
  - Used Cadence Design Suite to synthesize the design on 180nm tech library
- Object Dimensions from Image Fall 2018
  - Estimated arbitrary dimension of an object using a webcam and an ultrasonic sensor
  - Implemented on Intel Galileo Gen 2 board

- Self balancing robot — Fall 2017
  - Combination of Gyroscope and Accelerometer with PID controller to balance the robot
  - Parallelized sensor data acquisition and simultaneous motor control
  - Prototyped on FPGA
- Audio watermarking — Spring 2017
  - Embedded images in an audio track as watermark using Discrete Wavelet Transform
  - Validated robustness of watermarking against attacks like re-sampling and additive noise

Programming Skills

- Languages: C, C++, SystemVerilog, Python, VHDL
- Softwares & Tools: Synopsys VCS, MATLAB, Git, Xilinx-Vivado, PyTorch

Awards and Achievements

- DAVIS (Densely Annotated VIdeo Segmentation) Deep Learning Contest — Qualcomm, April 2021
  - Joint Winner : Co-organized by Qualcomm and Weights & Biases
  - Competition was open to employees of Qualcomm in 8 countries
  - Proposed an inexpensive Graph Neural Network (GNN) based solution to segment videos. Model parameters restricted within edge-device resource constraints $\leq 50M$ parameters
- Customer restaurant rating prediction - Machine Learning Contest — NITK, October 2018
  - Runner up - Predicted user rating from text-based reviews
  - Executed TF-IDF based sentimental analysis to estimate overall rating
  - Contest was part of annual intra-college machine learning competition
- JEE (Joint Entrance Examination) Mains — April 2015
  - All India Rank - 2729
  - Top 1% percentile
- National Science Talent Search Examination — April 2014
  - All India Rank - 91

Extracurricular

- Organizations/Clubs/Societies — Fall 2016 - Spring 2019
  - Executive Member at ACM: Peer mentorship, Student project review committee
  - Joint convenor of Tronix committee: An Electronics DIY/Hack interests group that organizes competitive events in the fields of Computer Vision and Robotics