Sathwik Gowripedda Sundaresh

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EDUCATION

- **National Institute of Technology Karnataka, Surathkal (NITK)** *2015-2019*
  Bachelor of Technology in Electronics and Communication Engineering GPA: 8.76/10

AREAS OF INTEREST

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

EXPERIENCE

- **Qualcomm** *Bangalore*
  Senior Engineer Jul 2019 - Present
  - Responsible for design and microarchitecture of vertex fetching unit of top of the line Qualcomm GPUs
  - Performed benchmark analysis to identify design bottlenecks
  - Re-designed and improved area efficiency by 15% with no performance degradation
  - Experience in verification activities including developing scalable testbench, adopting formal verification methodologies and support in post silicon debugs

- **Digital Signal Processing Lab** *NITK*
  Undergraduate Research - Prof. Sumam David S Aug 2018 - April 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 May 2018 - Jul 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 May 2017 - July 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
  - 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

- Audio watermarking
  - Embedded images in an audio track as watermark using Discrete Wavelet Transform
  - Validated robustness of watermarking against attacks like re-sampling and additive noise

Skills

- Languages: C, C++, SystemVerilog, Python, VHDL

- Tools & Frameworks: VCS, VCFormal, MATLAB, Git, Xilinx-Vivado, FPGAs, SV-UVM, 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