SREEVIDYA CHINTALAPATI

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EDUCATION

Indian Institute of Technology, Gandhinagar   2019 - 2023
Bachelors of Technology with Honours in Electrical Engineering (9.11/10.0)   *Gujarat, India*
Relevant Coursework: Linear Algebra, Advanced Signal Processing, Computer Architecture, Communication Systems
Labwork: Electrical Systems, Power Electronics, Embedded Systems, Analog Circuits, Digital Systems

RESEARCH PROJECTS

3D Scene Reconstruction with Single Photon Camera Captures   August 2024 - Present
Position: Project Associate, Advisor: Prof. Aswin C Sankaranarayanan and Prof. Kaushik Mitra   *CMU and IIT Madras*

- Proposed a framework to reconstruct high-speed scenes from single-photon camera captures using Gaussian Splatting by modeling photon probabilities at each pixel
- Developed novel 3D spatial filter for noise reduction, producing view-consistent, noise-free images from binary data
- Enabled view-consistent single reference based colorization and evaluated geometry reconstruction on real multi-view dataset

Facial Photometric Reconstruction in Desktop Screen Light Conditions   January 2023 - May 2023
Advisor: Prof. Shanmuganathan Raman   *IIT Gandhinagar*

- Aligned facial images through landmark identification with a pre-trained network and affine transformation to improve normal estimation accuracy
- Modeled light maps as Gaussian distributions to simplify the network's solution to the Rendering Equation
- Developed a U-Net-based architecture for image reconstruction under target lighting, hypothesizing separability of geometric and lighting features, and presented findings at the UG Research Showcase [poster]

Logistic Distance based Distributed Estimation in Wireless Sensor Networks   December 2022 - May 2023
Advisor: Prof. Nithin V George   *IIT Gandhinagar*

- Simulated performance of different sparse-aware algorithms for Wireless Sensor Networks modelled as connected graphs, while ensuring same initial convergence
- Formulated the distributed generalisation of Logistic distance metric adaptive filter and developed a learning strategy based on GGM-LDMAF algorithm under the guidance of my advisor
- Extensively simulated and analyzed the performance of distributed GGM-LDMAF algorithm for various sparse systems under a distributed setting with different combination policies. Identified that Adapt Then Combine (ATC) combination strategy is the most optimal and presented [poster] in UG Research Showcase

INDUSTRY EXPERIENCE

Credit Trading Desk Analyst, Barclays   June 2023 - June 2024

Supported US High Grade Flow traders with daily reports, post-trade analytics and adhoc queries. Developed an understanding of bid-ask spread based trade ideas. Contributed in automations for European Union and US Flow desks

Digital Design Intern, Texas Instruments   May 2022 - July 2022

- Independently worked on *Optimising Test source for High Frequency Operation* in the FPGA Validation Team
- Incorporated Pipelining and Re-timing for more than 20 modules to improving the closing frequency
- Verified every module through random vector generation to ensure that module level logic consistency. Ensured that resultant delay remained same in the higher-level modules
- Implemented the Test source to understand the hardware constraints and further simplify the optimisation

TEACHING ASSISTANTSHIP

Deep Learning Practices (DLP) - Online BSc IIT Madras, Fall 2024 (Prof. Kaushik Mitra): Worked on setting up the code and online tutorial session on Monocular Depth Estimation using UNet based architecture

EE5176 - Computational Photography, Fall 2024, IIT Madras (Prof. Kaushik Mitra): Mentored students on the research project on Depth Estimation from Sparse Focal stack images

ES216- Signals, Systems and Networks, Spring 2023, IIT Gandhinagar (Prof. Himanshu Shekhar) Facilitated MATLAB help sessions, doubt clarification, and post-assessment reviews to enhance understanding and encourage peer learning. Assisted in delivering tutorial content, collaborated with instructor on assignment in Signal Processing for Biomedical Research, and curated supplementary materials from "Principles of Linear Systems and Signals"

PROJECTS

Audio Denoising   February 2023 - March 2023

- Implemented LMS algorithm on Simulink for Android, by connecting mobile phones through TCP/IP server, and taking audio input from microphones respectively

- Designed and Implemented NLMS algorithm and Set Membership NLMS algorithm on Speedgoat Performance Realtime Target Machine. Calibrated the Noise reduction through PESQ comparison from the audio signal captured at the ears of dummy head

Practical Implementation of Butterworth Lowpass filter   November 2022

- Designed a digital LPF on MATLAB and sixth order analog filter using Sallen-Key topology to reduce the number of components on LT Spice

- Utilised DipTrace software for designing and spatially optimising the PCB layout

- We soldered the components on the milled PCB and demonstrated the working of the LPF

Snoop Resistant Secure Communication System   November 2022

- Implemented a real-time scrambling technique to create a secure wireless voice communication network using Simulink for Android. The real and imaginary parts of the FFT were split and permuted such that magnitude and phase data are separated and adjacent values are not sufficient for reconstruction.

- Transmitted the encrypted signal after typecasting into int16 to reduce the latency. Reconstructed the signal at the receiver end through re-permutation and inverse FFT

- Added a moving average filter after Decryption to reduce the noise due to precision error and added some amplification.

Signal Detection and Reconstruction   August 2022 - November 2022

- *Robust Regression for Curve Fitting* Fitted given dataset to underlying polynomial equation using RANSAC in python for reducing the effect of outliers

- *QRS Detection from ECG signals* Performed QRS detection on ECG signals from the MIT-BIH Arrhythmia Database by implementing Pan-Tompkins Algorithm for QRS detection in Python

- *Image Denoising* Programmed Non-Local Means algorithm for image denoising in Python and compared the results with Gaussian Filtering method

Spiking Neural Networks (SNN) for Image Recognition   May 2021 -August 2021
Acquired the knowledge of Brain Inspired Computing and applications. Studied the asynchronous and real time processing of SNNs. Implemented SNN for image classification in MNIST dataset

Vehicle Number Plate Detection   October 2020- November 2020
Implemented Gaussian filter and Sobel Operator for edge detection in Verilog. Applied Rectangular Hough Transform to detect the number plate in MATLAB. Identified the characters of the number plate by image mapping and window sliding based approach in Verilog

ACHIEVEMENTS

- Received A+ (11/10) for exceptional performance in EE341: Communication Systems and HS423:Writing Lab

- Awarded the prestigious Dean's List for Academic Excellence three times in Semester-I: 2020-21, Semester-II: 2021-22, Semester-I: 2022-2023 respectively

POSITIONS OF RESPONSIBILITY

- **Overall Coordinator, Entrepreneurship Initiative IIT Gandhinagar**   May 2021-March 2022
  Organised Investment lecture series, events to foster entrepreneurial thinking

- **Sponsorship Team Member, Amathea Technical Summit'19,'20, IIT Gandhinagar**
  Worked in a team of 12 people to collect a sponsorship amount of 30 lakhs. Organized the Networking Dinner, for the collaboration of the sponsors and the IITGN fraternity. In 2020, during the COVID-19 pandemic, we budgeted and raised sponsorship amount for the online version of Amalthea