BHUYASHI DEKA

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EDUCATION

University of Wisconsin - Madison Sept 2024 - May 2026
Master of Science, Computer Science *Madison, US*
Courses: Computer Vision, Computer Graphics, Artificial Intelligence

Indian Institute of Technology, Bombay Jul 2016 - Aug 2021
Master & Bachelor of Technology, Electrical Engineering *Mumbai, India*
Courses: Processor Design, Computer Architecture, Digital Signal Processing, Probability & Statistics

WORK EXPERIENCE

Samsung Semiconductor India Research Jul 2021 - Aug 2024
Hardware-Software Codesign: Computer Vision *Bangalore, India*

- Developed a **temporal denoising** engine for weighted averaging of consecutive frames using wavelet transform for frame downscaling, neural engine-based weight map estimation, and bilinear interpolation for upscaling weight map
- Worked on **Dense Optical Flow** engine to reduce image motion artefacts by estimating vector maps between two frames
- Developed a **decision tree** and **deep learning** model to replace the in-house SRAM memory area estimation tool, achieving 99.1% and 96.2% accuracy respectively, while improving runtime performance by nearly 100x
- Designed and developed a novel architecture for **Gamma Correction** which is a recurring algorithm in the imaging pipeline
- Built an automation engine using **Python** and csh with a **PyQt**-designed GUI to streamline tool workflows, integrating tool setup, execution, and error reporting, which improved efficiency by 75% and reduced result review time by 90%
- Automated the performance and area estimation process for **PPA** analysis effectively reducing man hours by 50%
- Received the **Spotlight Award** three times in a span of two years for exceptional performance and contributions to the team
- Promoted to Associate Staff Engineer position for showcasing strong technical skills and exemplary work

Power Management IC Design - Intern May 2019 - Jul 2019

- Designed behavioral model for Power Management IC modules like oscillators, dropout regulators, buck-boost converters
- Automated code generation using **Perl**; analyzed **VerilogA**, **SystemVerilog**, and schematic models, and created testbenches

Intello Labs Dec 2018 - Jan 2019
Data Analytics - Intern *Mumbai, India*

- Compiled a dataset from manually collected invasive sugar level measurements to fine-tune a non-invasive medical device
- Analyzed the data collected and fit a **polynomial regression** curve to the device parameters to improve its prediction

RESEARCH EXPERIENCE

Spatio-Temporal Noise Reduction Algorithm for Low-end devices *Samsung Semiconductor*

- Developed a light-weight spatio-temporal denoising algorithm for low-end Samsung phones for the price-sensitive sector
- Enhanced the **non-local means** algorithm by using noise estimation, adaptive smoothing, and total variation minimization
- Presented the work at the Samsung Semiconductor India RnD TechCon 2023 and was awarded the **best paper**

Efficient architecture for 3D CNN Acceleration *Master's Thesis, IIT Bombay*

- Experimented with hardware architectures to efficiently run **convolutional neural networks**, improving resource utilization
- Implemented depthwise convolution, optimized looping and tiling order to reduce hardware and align it to data flow

PROJECTS

Surveillance video people detection and counting *IIT Bombay*

- Developed a people-tracking system using background subtraction, image cleaning, and bounding boxes for object detection
- Trained an **SVM** with Aggregate Channel Features and optimized sliding window stride to reduce over-counting

Comparative Analysis of Pathfinding Algorithms *IIT Bombay*

- Developed a maze generation system using depth-first search to simulate real-time pathfinding with visual representation
- Implemented multiple algorithms like **A*, DFS, BFS** in Python to compare their efficiency on dynamically generated mazes

SKILLS

Languages: Python, C, C++, SystemVerilog, VHDL, Assembly, SQL, JavaScript, MATLAB
Libraries & Tools: PyTorch, TensorFlow, OpenCV, Numpy, Scikit, Pandas, Matplotlib, OpenGL, git, Linux
Boards: DE0-Nano FPGA board, Raspberry Pi 3, Arduino, Tiva-C