Karthikeyan R

To be Electronics Engineer, With Computer science in mind

2 November 2,2001

College Of Engineering Guindy, Anna University

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Indian Citizenship

Social Network -



Github Projects Page Link



LinkedIn Link











Tensorflow



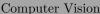














LTSpice



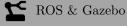


OpenLane





HFSS





Deep RL





CSS

Languages











Tamil



Education

2019 - present Bachelor of Engineering in Electronics

and Communication

Current CGPA - 9.54 out of 10

2019 Class XII National Victor Public School

Aggregate -95.2%

2017 Class X National Victor Public School

CGPA - 10 out of 10

Work Experience

May 2022 -Undergraduate Researcher at Integrated Systems Laboratory

CEG, Anna University

University of Toronto August 2022

Summer research under Prof. Roman Genov at the University of Toronto: developed a RISCV chip for mask generation for codedexposure image sensors. Completed a Continuous Integration flow for the project. Completed an Automatic Documentation engine for the

June 2021 -July 2021

Undergraduate Researcher at The Integrated Systems Laboratory Indian Academy of Sciences(IAS)

Project under Summer Research fellowship: Image-Based-Rendering based Reinforcement learning environment for end-to-end training to avoid sim2real, domain adaptation or domain randomization etc using CUDA and OpenGL

May 2021 -January 2022

Undergraduate Researcher at Integrated Systems Laboratory

Anna University

Worked on GPS Baseband Engine(Digital) IC design and Temperature

Sensor(Analog) IC design

Projects

August 2022 -

H.264 Video Codec Accelerator

December 2022

An Verilog Implementation of the H.264 Video Codec accelerator over PCIe. Simulated using Verilator, SystemC-TLM, QEMU. Includes Device Drivers for Linux using DMA and Verilog.

Present

January 2023 - Implementation of a Hierarchical Mesh based Machine Learning Inference Accelerator

> A SystemVerilog Implementation of the Eyeriss CNN architecture with Network-on-Chip(NoC) optimization to maximize data reuse. Implemented using ASAP7 Predictive PDK.

August 2021 -

Metis(V1 & V2)

January 2023

A programmable 256-neuron, 2048-synapse neuromorphic chip in 130nm CMOS is developed to accelerate inference and learning for various types of recurrent spiking neural networks(RSNNs). The chip features an analog circuit for leaky integrate-and-fire neuron and on-chip e-prop learning. The on-chip e-prop trains a spiking neural network to achieve an accuracy of 98.96% in MNIST dataset with power efficiency of 4.78pJ/SOP at 1.8V. It is also able to learn intelligent behaviour from rewards as shown in the Atari video games.

August 2022 -December

Hardware-Software Codesign for Verilog development over

2022

Developed a PCIe-Verilog verification setup for codesign using QEMU and SystemC-TLM. Used to develop Firmware and Hardware simulataneously. Uses Remote Port IPC to connect the QEMU Virtual machine and the Verilator simulation

June 2020 - Tyche

October 2020 Adaptive traffic control using Deep Reinforcement Learning: Deep Q-

Network and Cityflow openAI gym environment. Uses Q-learning(and

PPO) to learn optimal traffic flow control

June 2020 -October 2020 Machine Learning Assisted Verification Methodology for Analog and Mixed Signal Circuits

Semiconductor Research Corporation(SRC)- Task 2982.001 The goal of the proposed work for AMS (Analog and Mixed Signal circuits) verification was to characterize the input space, the output space and the mapping between the two using ML techniques, in such a manner that the quality and efficiency of design verification is improved.

May 2021 - **RTDrone**

December 2021

An autonomous delivery drone for delivering packages to hostels from varsity gate made in collaboration with Robotics club of CEG using

ROS, Gazebo, AirSim, Pixhawk, YOLOV3, Nvidia Jetson Nano

August 2021 -December Koch Fractal Based Wearable Antenna Backed with EBG

Plane

2021 $\,$ $\,$ A low-profile antenna for wearable applications in WiMax standards.

Optimized for flexibility, efficiency and SAR values.

Achievements

2022 BIRAC Startup Grant- Funding for 'Ultrafast, Accurate

Nanopore DNA sequencing using custom ASIC' Startup

2021 First Position- Techstars Startup Weekend Chennai

2021 First Position- MATRIMAZE: An Advanced Matlab

Competition, Vision 2021

2021 First Position- Web development Hackathon, Abacus CEG 2021

2018 - 2019 Third Prize- Silicon Battles Delhi, Senior Quiz

Positions

April 2021 - Student director- Computer Society of Anna university- Web

present and app

December Director- Robotics Club of CEG

2020 - present

Workshops Attended

2017 **IOT Workshop**

An in-depth look at IOT with a special focus on Artificial Intelligence

and Cybersecurity

2020 Operating Systems Workshop, Kurukshetra 2020

A Deep look at Unix/Linux internals and File Systems

2020 Basic Robotics Workshop

A Basic Robotics workshop with hands-on experience

Extra-Curricular Activities

Sports Badminton, Handball

Music Flute