

Karthikeyan Renga Rajan

- November 2,2001
- College Of Engineering Guindy, Anna University
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- Indian Citizenship

Social Network



Github Projects Page Link

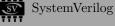
LinkedIn Link

Linux

C/C++







Tensorflow



CUDA

Vivado





OpenLane



Computer Vision



LTSpice







HTML

CSS

languages

English

TOEFL - 116/120

Hindi

Native

Tamil

Native

Education

2019 - 2023 Bachelor of Engineering in Electronics

and Communication

CGPA - 9.41 out of 10

2019 Class XII National Victor Public School, Delhi

Aggregate -95.2%

2017 Class X National Victor Public School, Delhi

CGPA - 10 out of 10

Work Experience

December Co-founder at HelixLogic Chennai

2022 - Present

Design and Implementation of an ASIC to decode DNA sequences

based on signals derived from a Nanopore Membrane

May 2022 -

Undergraduate Researcher at University of Toronto, Canada

CEG, Anna University

August 2022

Summer research under Prof. Roman Genov at the University of Toronto: developed a RISC-V core 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 -

Undergraduate Researcher at

Integrated Systems Laboratory

January 2022 Anna University

project.

Worked on GPS Baseband Engine(Digital) 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.

January 2023 -April 2023

Implementation of a Machine Learning Inference Accelerator with a Hierarchical Mesh-based NoC

A SystemVerilog Implementation of the Eyeriss CNN architecture with Network-on-Chip(NoC) optimization to maximize data reuse and approximate multipliers to increase speed and energy efficiency. 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.

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 -

Machine Learning Assisted Verification Methodology for

October 2020 **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.

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

First Position- MATRIMAZE: An Advanced Matlab 2021

Competition, Vision 2021

2021 First Position- Web development Hackathon, Abacus CEG 2021

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

Positions

Director- Robotics Club of CEG December

2020 - April 2023

April 2021 -Student director- Computer Society of Anna university April 2023 - Conducted workshops for junior students to teach them the

technical skills required and plan their careers ahead

Director- National Service Scheme(NSS), India April 2021 -

April 2023 - Contributed to the distribution of vaccines for those in need

during the COVID-19 pandemic

Workshops Attended

2017 **IOT Workshop**

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

and Cybersecurity

Operating Systems Workshop, Kurukshetra 2020 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, Violin