VAKEESAN KARUNANITHY

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OBJECTIVE

Final year student in Electronic and Telecommunication Engineering, passionate about Machine learning and Computer vision. Having strong fundamental knowledge on computer architecture, programming and ML domains.

EDUCATION

B.Sc. Engineering Hons. in Electronic and Telecommunication Engineering   **2020 - Present**
University of Moratuwa, Srilanka. CGPA : 3.66

G.C.E. Advanced Level in physical science stream   **2016 - 2018**
    Island-Rank: 215   **Z-score: 2.2096**
    Mathematics: A, Chemistry: A and Physics: A

External courses
    AI Programming with Python Nano-degree (Udacity)   **2023**

SKILLS

Programming languages	Python, C, C++, MATLAB
Frameworks	Pytorch, Tensorflow, OpenCV
HDL	Verilog, SystemVerilog
Micro controller platforms	Ti Launchpad, Raspberry pi, STM32, Arduino
Design Tools	Solidworks, Altium Designer, KiCAD

WORK EXPERIENCE

Electronic Engineering Intern: ExcelTech OÜ   **Jan 2023 - Jun 2023**
Worked in PCB hardware debugging and significant contribution in firmware developing. Altium Designer, MATLAB and Ti-microcontroller SDK(C language) were used. Found a method in hand soldering to deliver the sample products on time. Knowledge about power electronics, PCB antenna impedance matching and communication protocols such as I2C, NRZ and SPI were applied.

Visiting Instructor(Full-time): University of Moratuwa   **Aug 2023 - Dec 2023**
Guided first year students to understand the basic of electronics via proper in-person explanation of each equipment and development kits such as Intel's Altera FPGAs and STM32 development boards. Given last project for the students to apply their basic analog electronics knowledge in a practical environment.

Visiting Instructor(Part-time): University of Moratuwa   **Oct 2022 - Feb 2023**
Taught second year students the introduction to robotics. introduced wide variety of topics and tools such as PID controlling, Interrupt and polling, Servo motor controlling. Basic movement of robots were taught from fundamental knowledge about encoders and their usage.

PROJECTS

3D printer defects detection and correction (FYP) :
Aspired to develop a camera-based defects detection system for FDM printers with a focus on identifying potential errors. Planned to mitigate common issues by implementing a two-camera setup: one positioned towards the nozzle and the other outside the printing area. Intended to issue relevant commands to the printer, including the option to halt operations or provide coordinates for the next layer. Currently engaged in discussions of the correction mechanism. Machine learning and image processing techniques are currently being tested.

Transfer learning image classifier :
102 types of flowers' dataset is used to train the model by the transfer learning. I could get the classifier's accuracy more than 80%. Basically user can train and predict from the command line interface with specific pre-tarined model for feature extractor. Classifier has to be trained by the user before prediction.

Image processing on ZYNQ :
Image file can be transferred from computer to DDR by UART. Then the PL part will do the convolution using an efficient way for a small buffer sized convolutions on FPGA. Finally the convolved data send back to PS then Computer using UART. Edge detection task was tested successfully. All other kernel based convolutions can be done as well.

Matrix multiplication IP :
The software and hardware co-design on the ZYNQ SoC platform is chosen. AXI4 stream interface used for the IP and other required IPs imported directly from Xilinx's Vivado. Tools: Vivado, SDK, ZYBO development board

Smart Switch :
Aim is to control the home appliances by the developed mobile app, using IOT and power electronics knowledge to create a full product satisfying the commercial expectations.

Lead Acid Battery Charger :
Developing 24V, 8A constant current lead acid battery charger using the power electronics as well as the analog electronics knowledge.

Passive Infrared sensor :
Goal is to using only the fundamental components like diodes, transistors and gate ICs to make the PIR sensor to detect the Human motion with normal and re-triggering mode which is in a commercial PIR sensor module.

RGB colour sensor :
Target was to measure the Red, Green and Blue values of any particular surfaces using the reflected intensity of lights By LDR and programmed the ATmega328P using Assembly Language rather than Arduino syntax.

POSITION OF RESPONSIBILITY

Representative of the Department of ENTC	**December 2021 - July 2023**
Senior head Prefect, Vavuniya Vipulanantha College.	**2017 - 2018**

AWARDS AND ACHIEVEMENTS

IEEE Electronic Design Competition	**2023**
Honorable Mention, Advanced PCB Design Competition	**2021**
First place, National level mathematics quiz competition	**2017**
Honorable Mention, Provincial level Science quiz competition	**2014, 2015**

REFERENCES

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