# ZAHIN M. ZAMAN

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## PROJECTS

### Spoilers Alert
*Python, SciPy, Universal Sentence Encoder*

- Incorporated **natural language processing** tools to construct spoiler detection program for popular TV shows
- Restructured text into vectors using **Google's Universal Sentence Encoder** to assess semantic similarity
- Implemented **least-squares regression** using **SciPy** with **sigmoid function** model to execute binary classification

### Smart Wardrobe
*Python, TensorFlow, Pillow, Matplotlib, PyQt*

- Modelled multi-layered neural network with **TensorFlow** and **Keras** to categorize pieces of clothing
- Extracted image data using **Pillow** and visually presented training data accuracy with **Matplotlib**
- Optimized cost function based on **mean-squared error** by implementing **stochastic gradient descent**
- Incorporated **multi-threading** in Python to develop interactive user interface with **PyQt**

### Digital Piggy Bank
*C++, Raspberry Pi Zero W*

- Constructed coin-identifying piggy bank with lasers and photodiodes using **Raspberry Pi Zero W**
- Assembled circuit to read analog voltage using operational amplifier and differential comparator
- Implemented **state machines** and **watchdog timers** to program and monitor state of lasers

### Ubisoft Game Dev Challenge
*C++, SFML, HackerNest API*

- Employed **Ubisoft's HackerNest API** and **SFML** library in to develop adventure minigame
- Executed realistic physical movement by installing smooth sprite animation
- Enhanced gameplay and mechanics by incorporating precise game physics

## TECHNICAL SKILLS

**Programming:** C, C++, Python, HTML, CSS, Javascript, Perl, SystemVerilog, VHDL, ARM Assembly

**Tools & Frameworks:** Linux, Windows, Git, Tensorflow, Keras, scikit-learn, OpenCV, Django, Flask, PyQt5

## EXPERIENCE

### Software Development & Testing Engineer
*Wind River Systems | Sept 2020 – Dec 2020*

- Rectified multi-threading and memory-based defects for **VxWorks** RTOS and **Helix Virtualization Platform**
- Debugged and reconfigured source code in **C** and utilized inline **Assembly** to write thread-safe functions
- Formulated **git hook** to block restricted commits and echo terminal warning
- Developed **Python** script with interactive GUI using **PyQt5** to assist in git commit message format

### Open-Source Software Developer
*codePrentice | Sept 2020 – Present*

- Streamlined **Python** code flow for open-source **multiparty-computation** project **MP-SPDZ**
- Expanded machine learning computation to support **Tensorflow SqueezeNet** model

### Display Verification Engineer
*Qualcomm | Jan 2020 – May 2020*

- Engineered **SystemVerilog assertions** and **C++** simulations tests to verify display processor design
- Attained **20%** increase in functional coverages by debugging waveform using **Synopsys Verdi** tool
- Automated **formal verification** using **Perl** scripting to extract design hierarchy and formulate assertions
- Web-scraped design database and employed **PyQt5** to build interactive GUI for managing hardware registers

### Embedded Software Developer
*Imagine Communications | May 2019 – August 2019*

- Reconstructed source code in **C/C++** on a **Linux** environment to fix firmware bugs
- Extracted IP routing data from data structures and developed troubleshooting functions and mapping tables
- Utilized **SoapUI** to inspect and track **REST API** processes

### CAN Interfacing Team Member
*WATonomous | Jan 2019 – April 2019*

- Developed **Python** code in **ROS** framework for car's lock and turn signals and inertial navigation system driver
- Enhanced low-speed **CAN** interfacing system of the car and performed simulation in **Virtual CAN Driver**

## EDUCATION

### University of Waterloo
*B.A.Sc. in Electrical Engineering, 2B | Sept 2018 – May 2023*

- **Term Dean's Honour List,** for outstanding academic performance
- **President's Scholarship of Distinction,** for 95%+ admission average