Dhanush Karthikeyan

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OBJECTIVE

To secure a role where I can apply my strong work ethic and diverse skillset towards innovative research.

EDUCATION

Bachelor of Science in Computer Engineering (GPA: 3.85) **Graduating May 2022**
California State Polytechnic University, Pomona

Bachelor of Science in Electrical Engineering **Graduating May 2022**
California State Polytechnic University, Pomona

SKILLS

- C, C#, Python, SQL, PIC Assembly Language
- MATLAB, Verilog, and LabVIEW
- strong verbal and written communication
- FPGA Development, Xilinx Zynq SoC
- Solidworks, CATIA, Cura, 3-D Modeling
- batch scripting, lab testing equipment
- PCB Design: Autodesk Eagle, EasyEDA
- OrCAD PSpice Simulation Software, LTspice
- Javascript / React / Web Development
- Project Management / Product Development
- Arduino, Raspberry Pi, Microsoft Office Suite
- great collaborative and interpersonal skills

INDUSTRY EXPERIENCE

Amazon Lab126 (Sunnyvale, CA) **June 2020 – August 2021**
Software/Hardware Engineering Intern

- Contributed to the large-scale Amazon initiative of establishing automated Coronavirus testing laboratories
- Successfully pitched to management and oversaw the development of an automated regression script framework for end-to-end logic tracing and data validation
- Developed software using Python, Flask, Pandas, and SQL for full-stack support for various teams
- Integrated AWS CloudWatch to analyze permissions issues, response times, and system functionality

NASA-CPP Startup – Posturonic (Pomona, CA) **July 2019 – January 2021**
Lead Product Developer

- Designed consumer-grade hardware utilizing NASA fiber-optic patents to capture human motion
- Managed embedded software in assembly, C, and micropython to interface with IOS application
- Conducted complete product development cycle from market research, R&D, schematic design, rapid prototyping, PCB design, field failure analysis, and product pitching to potential stakeholders
- Created end-to-end design and implementation of test framework for sensors, ranging from pressure sensors, flex sensors, strain gauges, accelerometers, and gyroscopes

Safran Electronics and Defense, Avionics USA (Irvine, CA) **June 2019 - May 2020**
Systems Integration and Test Engineering Intern

- Directed failure and root cause analysis on flight hardware using proprietary hardware instruments
- Conducted High Intensity Radiated Fields and Lightning testing on proprietary Horizontal Stabilizer Control Systems to ensure immunity to exposure to electromagnetic environments
- Communicated with customer to define project requirements and worked with cross-functional mechanical, materials, electrical, and systems teams on engineering roadmap for successful project execution

RELEVANT COURSEWORK

- Object-Oriented Programming
- Data Structures and Algorithms
- Operating Systems
- Computer Architecture
- Circuit Analysis I, II
- Assembly/Microcontrollers
- Signals Processing
- Communication Systems
- Control Systems
- Robotics
- Power Engineering
- RF IC Design
- Network Forensics
- Instrumentation
- VLSI Design
- Project Design

AFFILIATIONS

- IEEE, MEP, Association of Energy Engineers (2019 President), Kellogg Honor College, LSAMP, CalBridge

AWARDS AND CERTIFICATIONS

- 8x Dean's List
- SDHacks 2019 Winner
- Lockheed Martin Scholar
- Edison STEM Scholar
- Boeing Scholar
- Seal of Biliteracy

RESEARCH EXPERIENCE

NASA MUREP Innovative New Designs in Space (MINDS) **Dec 2021 – Present**

California State Polytechnic University, Pomona
Advisor: Mohamed El-Hadedy Aly, PhD (Professor of Electrical and Computer Engineering)
Project: Securing Space Applications using Post-Quantum Cryptographic Algorithms

- Leading a team of undergraduates to design, fabricate, and deploy a simulated space mission to demonstrate the robustness of post-quantum security for space applications

Cyber Adaptive Learning Systems Lab Researcher **Aug 2021 – Present**

California State Polytechnic University, Pomona
Advisor: Santana Marin, PhD (Professor of Computer Science)
Project: Cascade Virality and Hacker Adoption Prediction

- Extending on my previous research work on virality prediction and finalizing paper for publication
- Directing team of graduate students on three independent research directions to assess different methods for hacker prediction using temporal network analysis

NSF Research Experience for Undergraduates (REU) **Jun 2021 – Aug 2021**

California State Polytechnic University, Pomona
Advisor: Santana Marin, PhD (Professor of Computer Science)
Project: Topology Driven Virality Detection in Malicious Cascades

- Mined hacker data from CYR3CON database to construct directed networks to extract social influence
- Generated and cleaned various datasets to train/test various classification models that determine virality of a malicious cascade to anticipate hacktivism campaigns and mass-adoptions of cyber threats
- Models yielded average F1 scores of 0.94 with balanced datasets and 0.74 with imbalanced datasets

NASA M-STAR Grant **Nov 2020 – Mar 2021**

California State Polytechnic University, Pomona
Advisor: Mohamed El-Hadedy Aly, PhD (Professor of Electrical and Computer Engineering)
Project: Low Power Implementation of Flight Software

- Worked with PI to deliver a new overlay architecture of JPL/NASA Fprime flight software on FPGA
- Creating the next generation of FPGA Fprime overlay architecture for cube satellites
- Developed discrete components in C++ and Python to benchmark hardware capabilities of PYNQ-Z2

NSF Research Experience for Undergraduates (REU) **Jun 2020 – Aug 2020**

University of Washington, Bothell, WA
Advisor: Kaibao Nie, PhD (Professor of Electrical Engineering)
Project: Automatic Fall Detection using Spectral and Temporal Features

- Developing automatic fall detection algorithms and machine learning models to identify falls based on FARSEEING database of recorded falls in the elderly population
- Making use of various classifiers and neural networks to assess possible IOT deployment in the field

NASA MUREP Innovative New Designs in Space (MINDS) **May 2019 – July 2019**

California State Polytechnic University, Pomona
Advisor: Mohamed El-Hadedy Aly, PhD (Professor of Electrical and Computer Engineering)
Project: S-Curve Motion Controller Project

- Developed motion controllers with reconfigurable profiles, producing higher order derivatives of velocity to achieve a customized “smoothness” of desired motion profiles
- Researching, programming, and implementing an efficient way for autonomous drones to move by mapping out different environments and using a camera-based system for it to move collision-free

Zhen Lab Research Undergraduate Researcher **Sep 2017 – July 2019**

California State Polytechnic University, Pomona
Advisor: Zhen Yu, PhD (Professor of Electrical and Computer Engineering)
Project: Aeroelastic Induced Power Generation

- Designed and tested graphene supercapacitor power storage units
- Integrated my research to set new UAV endurance world record by harnessing aeroelastic effects