GAGAN PUNATHIL ELLATH

MS CE (Honors), USC Los Angeles, CA | | Github | 213-551-3031 | gpunathi@usc.edu | LinkedIn

EDUCATION

University of Southern California   LA
Master of Science, Computer Engineering – GPA 4.0/4.0   January 2022-Present
Courses: Operating Systems, Broadband Networks, Introduction to Computer Networks, Computer Systems Organization, Introduction to Digital Image Processing, Internet and Cloud Computing

Nitte Meenakshi Institute of Technology (NMIT), VTU – GPA 9.09/10   India
Bachelor of Engineering, Electrical Engineering   August 2015-May 2019

TECHNICAL SKILLS

Programming Languages: Python, C, C++, Python, MATLAB, Bash Scripting
Frameworks/Tools/Applications: Git, Jira, TensorFlow, Keras, Pandas, NumPy, OpenCV, Arduino, MBed, AUTOSAR, Anaconda, Eclipse, Vim, GitHub, Windows, Linux, AWS EC2, VPC, Mininet, Pox SDN, OpenFlow, Wireshark, ModelSIM,Raspberry PI
Technical Knowledge in: Embedded Systems, Computer Networks, Protocols Such as Ethernet, TCP/IP, UDP/IP, DNS, ICMP, DHCP, ARP, CAN, LIN, Computer Architecture, Computer Vision, Robotics, Virtual Memory, Pipelining, Cache Coherency, Tomasulo Part – 3,

WORK EXPERIENCE

Media Communications Lab (MCL), USC   USA
Research Intern   May 2023-Present
- Engineered adversarial attacks to evaluate robustness of ML pipelines leveraging Python, Numpy, Tensorflow, and PyTorch, reducing accuracy to 30% from 93% for multiple Image datasets. Created a backpropagation module for the custom machine learning module for adversarial attack generation. Translated machine learning module from native Python to Tensorflow to reduce execution time by 90%

Course Mentor/ Teaching Assistant, University of Southern California   USA
Teaching Assistant   August 2022-May 2023
- Contributed as a Teaching Assistant for EE450: Introduction to Computer Networks
- Conducted discussion sessions for a class with 200+ students enrolled. Assisted students in assignments and labs, including DHCP, DNS, and ARP packet analysis utilizing Wireshark. Designed a socket programming project and evaluated projects of 30+ students. Instructed students on Socket Programming, TCP, UDP, IP Protocols, and Routing Algorithms.

Robert Bosch Engineering and Business Solutions Private Limited (RBEI)   India
Software Engineer   August 2019-December 2021
- Software Developer for In-vehicle Communications team, French OEM Customer - P.S.A (Currently Stellantis)
- Performed AUTOSAR Communication Stack Requirement Analysis and Review, Configuration, Software Development in C, and Unit Testing for multiple projects with different Engine ECUs for CAN, CAN FD, and LIN protocols.
- Coded MISRA-compliant C - Customer Signal Conversion Layer and Interface Layer and used Canalyzer, INCA, HIL, and JTag for unit tests. Built Python and Java-based tools for automatic C code generation directly from customer requirement documents and improved development stage productivity by 10%. Initiated faster requirement analysis using Python.

Centre for Robotics Research (CRR)   India
Intern   August 2019-December 2021
- Interfaced different sensors (Ultrasonic, Wheel Position) and actuators (Motors) harnessing I2C, and SPI protocols on a 4 wheeled robot controlled by Mbed LPC-1768 and Raspberry Pi, enhancing response speed by 5%.

PROJECTS

Weenix Operating System; C GDB vim valgrind VFS VM Multi-Threading
- Built Operating System from ground up modeled after Unix 6th Edition, emphasizing thread and process management, resource sharing, virtual file system, and virtual memory maps to facilitate user space program execution. Implemented critical system calls, including fork(), write(), read(), mmap(). Stress tested by generating over 500 threads.

Image Processing Algorithms; Python C++ MATLAB OpenCV
- Designed image processing algorithms, including demosaicing, denoising, half-toning, dithering, homographic transformation, morphological processing, texture segmentation and custom machine learning pipeline design for image classification using C++ and MATLAB.

Custom UDP Protocol for Fast File Transfer; C++ GDB vim VirtualBox AWS EC2 Mutex POSIX Multithreading UDP/IP
- Created a custom UDP protocol with added reliability at application layer for fast file transfer. Transferred up to 1 Gb file sizes between AWS instances, incorporating multiple threads to enhance link utilization and ensure reliability through packet counting at the application layer. Achieved superior throughput compared to SCP and validated md5sum file transfer integrity in a network with 20% packet loss.

LEADERSHIP

- Gaming club coordinator at college level in India, conducted and planned events for 50 people.
- Oversaw a team of two for a small project in RBEI, assigning tasks and managing resources for a one-month period.