Carroll Vance

Email: cs.vance AT icloud.com
Portfolio & Github: https://csvance.github.io

Profile

I have professional experience working with embedded and real-time systems for a variety of applications including robotics, automation, networking, and storage. I also have a passion for machine learning, and am currently involved with a research group on campus doing time series prediction to prediction future levels of various pollutants.

Skills

Developed applications for embedded micro controllers and microprocessors such as PIC, dsPIC, ARM Cortex M0, M3, M4, A7, A15, A57 and more. Proficient in both C and Python. Experience with embedded Linux ranging from board bringup to custom distribution creation. Trained, optimized, and deployed convolutional neural networks for object detection and classification on embedded systems.

Education

UNIVERSITY OF HOUSTON – 2018-CURRENT

Expected Graduation: Fall 2020 with B.S. in Computer Science & Minor in Mathematics

HOUSTON COMMUNITY COLLEGE – 2016-2018

Studied Computer Science

CUMULATIVE GPA – 4.0

Experience

SOFTWARE ENGINEER, WILDCAT DEVELOPMENT; SPRING, TEXAS – 2009-2016

Designed, implemented, tested, and debugged embedded software for companies such as Baker Hughes, Hewlett Packard Enterprise, and National Oilwell Varco

SYSTEMS VALIDATION TESTER, WAILUA TECHNOLOGY; HOUSTON, TEXAS – 2008-2009

Executed test plan for flash memory technology created by Spansion and Virident Systems

Extracurricular

CULLEN COLLEGE OF ENGINEERING IEEE – MAKERSPACE OFFICER, 2018-CURRENT

Working on group projects such as indoor autonomous drones and robotic arms. Coordinating educational workshops. STEM community outreach

DATA ANALYTICS IN STUDENT HANDS - MEMBER, 2018-CURRENT

Projects

ARM A7 BOARD BRINGUP

Conducted board bringup on a custom PCB based on NXP IMX6 reference design running embedded Linux. Changes to device tree to support custom hardware and sensors. Debugging many hardware and software issues. This resulted in patches to the kernel in the case of PCIe, cutting a trace that was grounding a clock signal for ethernet, and many other issues being addressed. Used kernel debugging along with logic analyzer to diagnose issues.

JETSON TENSORRT

Created a series of ROS nodes for executing optimized deep learning object detection and classification inferences on nVidia's Jetson platform. 100% GPU preprocessing pipeline for minimal inference latency. Utilized ImageNet and OpenImages datasets to train object detector. Currently being used to develop a system to keep squirrels from taking fresh produce from gardens using blasts of water.

Github: https://github.com/csvance/jetson_tensorrt

WEARABLE SD CARD BACKUP DEVICE

Created firmware for a wearable file backup wristband with high speed USB and wireless capability. Implemented high speed file transfer between SD, eMMC, and USB 3.0 Mass Storage Mode. Ported Qualcomm QCA4002 driver and TCP/IP stack to ThreadX RTOS and implemented wireless file transfer. Due to memory constraints, implemented a finite state machine design where only relevant hardware modules were initialized.

AIR POLLUTION TIME SERIES PREDICTION

Exploratory data analysis with 50GB dataset of pollution data in Texas ranging from 2000 to 2017. Created preprocessing pipeline using OpenMPI / multiprocessing to handle missing data, windowing, and sequence creation on an HPC cluster. Testing various machine learning models including LSTM and Random Forests as well as different problem structures such as multiple regression and classification. Current focus is addressing nulls in data by utilizing spacial information to improve interpolation.