Carroll Vance

Data Scientist

Education

2018–Current	**B.S. Computer Science**, *University of Houston*, 3.83. Expected Graduation Fall 2020 with Minor in Mathematics
2016–2018	**Computer Science**, *Houston Community College*, 4.0.

Experience

Vocational

2019–Current	**Data Scientist Intern**, *Medical Metrics, Inc.*, Houston. End-to-end computer vision model creation, training, testing, refinement, and deployment for medical imaging. Fully integrated AI workflow with continuous integration, containerization, and deployment.
2009–2016	**Software Engineer**, *Wildcat Development*, Spring. Designed, implemented, and tested embedded controls software for companies such as Baker Hughes, Hewlett Packard Enterprise, and National Oilwell Varco

Skills

CV/ML/AI	Rigid Body Registration, Landmark Regression, Signal Detection, Object Localization, Recommender Systems, Data Augmentation, Custom NN Layers/Loss/Metrics, Ensembles/Boosting, Inference Optimization, Model Deployment
Languages	Python, C/C++, Shell Scripting/Command Line, MATLAB, R
Libraries	PyTorch, Keras, Tensorflow, NumPy, scikit-learn OpenCV, TensorRT, SciPy
Operational	Ubuntu, Docker, Gitlab CI/CD, Github
Mathematics	Signal and Image Processing, Numerical Analysis, Numerical Methods

Extracurricular

2020   **SMBI Hackathon (4th Place)**, *UTHealth*.
The theme of this hackathon was creating a cold start recommender system for drug repositioning with pancreatic cancer. My solution utilized adaptive boosting to work around certain types of tissue having far more training examples than others. I am currently working on refining my method for an upcoming research publication.

2019   **SMBI Hackathon (3rd Place)**, *UTHealth*.
Created a custom residual neural network and data augmentation strategy for detecting the onset of slow activity after a GTC seizure. Top ranking undergraduate student at the hackathon. Currently contributing to a peer reviewed publication on the subject in *BMC Medical Informatics and Decision Making*.

2019–Current   **Makers Codirector**, *IEEE UH*.
Coordinating prototypes for demonstration at ECE Conferences involving companies and other institutions to showcase potential of students. Responsible for hosting Build-a-Bot, Makers Arcade, and Makers Showcase, as well as securing company sponsorship for events.

2018–2019   **Workshop Coordinator**, *IEEE UH Makers*.
Coordinating educational workshops involving embedded systems, computer vision and machine learning. Working on group projects such as indoor autonomous drones and robotic arms.

Projects

2019   **Keras MobileDetectnet**.
MobileDetectNet is an object detector which uses MobileNet feature extractor to predict bounding boxes. It was designed to be computationally efficient for deployment on embedded systems and easy to train with limited data. It was inspired by the simple yet effective design of DetectNet and enhanced with the anchor system from Faster R-CNN. It includes online data augmentation capabilities utilizing multiprocessing with generators.
Github: `https://github.com/csvance/keras-mobile-detectnet`

2018   **Jetson TensorRT**.
Created a series of ROS nodes for executing optimized deep learning object detection and classification inferences on nVidias' 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`

2017   **Deep Connect Four**.
Created a Deep Q Network that learned to play connect four purely by self play. Tuning reward levels and replay buffer to stabilize training and increase convergence speed.
Github: `https://github.com/csvance/deep-connect-four`

2016   **Embedded Linux Board Bringup**.
Conducted board bringup on a custom PCB based on NXP IMX6 reference design. Changes to device tree to support custom hardware and sensors. Creating custom Linux distribution with Yocto Project. Developing kernel patches to address issues with PCIe. Used kernel debugger along with logic analyzer to diagnose software and hardware issues.