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Alex Zuzow

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Education

M.S. In Computer Science, University of Texas at Austin **GPA: 3.9** **August 2021 – Current**

B.S. In Computer Science, University of California, Irvine **October 2018 – December 2020**

Relevant Coursework: Advanced Computer Vision, Robot Learning, Autonomous Robots, Reinforcement Learning, Deep learning for Medical Images, Machine Learning, Artificial Intelligence for Biology, Intro to Computer Vision

Work Experience

NASA Jet Propulsion Laboratory **June 2020 – Current**

Machine Learning Research

- Researched and tested machine learning algorithms to predict hurricane rapid intensification.
- Presented my research in weekly meetings to JPL's Radar Science group (334H) which has lead to further research projects.
- Scraped and cleaned data from various online databases containing relevant hurricane information to create a database containing information on all storms from 1982-2011.

University of Texas at Austin **August 2021 – Current**

Graduate Teaching Assistant

- Held weekly meetings with students to check on progress and wrote weekly reports detailing each groups progress.
- Responsible for grading, hosting labs, office hours, and working with the professor and other teaching assistants to meet the needs of students.

University of California, Irvine **June 2019 – January 2020**

Undergraduate Machine Learning Research Assistant

- Applied machine learning algorithms such as logistic regression, random forest, and SVM in scikit-learn to detect cancer cell signals within patient's blood.

Projects

Autonomous Car using Imitation Learning **Fall 2021**

- Developed a End-to-End multimodal network with an input of RGB, 3D lidar, and optical flow images to create a fully autonomous vehicle in the Carla simulator.
- Uses a transformer as a backbone to encode the images in a early fusion manor, then sends the encoding plus other sensory data to a Waypoint prediction network which are then processed in a pid controller as a output.
- Comparable results to the top 5 on the Carla leaderboard challenge at the time of project completion

Realtime Lightweight Optical Flow **Fall 2021**

- Compressed a optical flow network via knowledge distillation(factor transfer).
- Compared compression versus performance loss of post-training quantization and quantization-aware training.
- Applied structural pruning to reduce feature maps.
- Reduced inference time by approximately 40% while maintaining accuracy.

Semantic Segmentation Of Minecraft **Spring 2020**

- Applied transfer learning using a DeepLabV3 backbone to classify block/entity classes.
- Able to classify with high accuracy over 160 classes, robust to weather changes and day night cycles.
- Created a data set using Microsoft's Malmo and CIELAB color space to classify which colors map to each block/entity.

Semantic Segmentation of Lesions **December 2020**

- Implemented a neural network following a 3-D U-Net architecture with a custom sparse cross-entropy loss function.
- Executed different strategies to combat class imbalance such as stratified sampling, pixel-level class weights, and pixel-level masked loss to create a high sensitivity detector.

Skills

Languages Python, C++, LaTeX, Java, C
Libraries pyTorch, Tensorflow, Detectron2, Scikit-learn, Matplotlib, Numpy, Android Studio, Excel, Pandas, OpenCV