Roberto Halpin Gregorio

M.S. Student, Computer Science
Cornell University
rgh224@cornell.edu

Education

Cornell University
M.S. in Computer Science, *2020 – Exp. 2022*
Ithaca, NY

Cornell University
B.S. in Computer Science, *2016 – 2020*
Ithaca, NY

Research Experience

Self-Supervised Learning **Cornell University**
M.S. Thesis Research *Oct 2020 - Current*

- Analyzing the effect of augmenting datasets with GAN generated images in self-supervised learning.
- Achieved improved accuracy when a subset of CIFAR-10 was augmented.
- Extending these experiments to semi-supervised, supervised, and transfer learning tasks.

Missing Indicator Method **Cornell University**
Research Project *Spring 2022*

- Worked on a NeurIPS submission focused on the Missing Indicator Method (MIM).
- Provide theory for MIM in a linear regression setting.
- Extensive empirical justification in a variety of settings and across a wide range of supervised learning models.
- Worked with Mike Van Ness and Madeleine Udell.

Contrastive Representation Learning **Cornell University**
Research Project *Spring 2022*

- Developed a new representation learning method called MIM-CLR.
- MIM-CLR combines contrastive and masked image modeling approaches.
- Our proposed method outperforms previous work in our experimental setting.

Representation Learning Theory **Cornell University**
Research Project *Fall 2021*

- Analyzed how to bound the best case loss and risk for learned representations.
- Improved the generality of previous bounds in literature.
- Extended bounds to include a k-layer neural network classifier.

Autonomous Vehicles - Amodal Segmentation **Cornell University**
Undergraduate/Graduate Researcher *Aug 2018 - Dec 2020*

- Developed amodal segmentation algorithms for road identification with self-driving cars.
- Designed a labeling tool used in-house and setup in Amazon MTurk for an amodal segmentation dataset project.
- Evaluated state-of-the-art 3D trackers and object detectors on full sensor datasets - KITTI, NuScenes, Lyft, Waymo, Argo.
- Collected and built a new synthetic dataset for amodal segmentation of road images.
- Worked under Wei-Lun Chao, Kilian Weinberger, Bharath Hariharan, and Mark Campbell.

Distributed Machine Learning **Cornell University**
Undergraduate Researcher *Oct 2019 - May 2020*

- Developed a new centralized distributed machine learning architecture.
- Created baselines for parameter server architecture on TensorFlow.
- Worked under Chris De Sa and Ken Birman.

Pancreas Tumor Segmentation **Cornell University**
Research Project *Fall 2018*

- Addressed the problem of the small amount of available medical data by using 2D slices of 3D voxels.
- Created new models that utilized our new generated dataset to segment pancreas tumors.

Computer Vision with Deep Learning **Cornell University**
Research Assistant *Summer 2018*

- Learned the basics of deep learning with respect to computer vision, and read many relevant papers.
- Participated in lab reading group and presented a deep stereo regression paper to the lab group.

Parallel SpMV Optimization through GPUs **U.C. Davis**
Research Assistant *Summer 2017*

- Implemented an efficient sparse vector-matrix multiplication algorithm.
- Learned parallel programming with CUDA.

Teaching Experience

CS 4670: Computer Vision
Teaching Assistant *Spring 2022*

CS 6787: Advanced Machine Learning Systems
Teaching Assistant *Fall 2021*

CS 4787: Principles of Large-Scale Machine Learning
Teaching Assistant *Spring 2019, 2020, 2021*

CS 4700: Foundations of Artificial Intelligence
Teaching Assistant *Fall 2020*

CS 4780: Machine Learning for Intelligent Systems
Teaching Assistant *Fall 2019*

Skills

Languages: Python, R, Julia, Java, Javascript, C/C++, MATLAB

Other: TensorFlow, PyTorch, OpenCV, Git, Slurm, CUDA, LaTeX

Last Update: October 2022