Daohan “Fred” Lu

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Seeking Internship in Computer Vision

Education

Carnegie Mellon University — Pittsburgh, PA
School of Computer Science — 12/2022
- Master of Science in Computer Vision

New York University — New York, NY
College of Arts and Science — 05/2021
- Bachelor of Arts in Economics and Computer Science
- GPA: 3.86/4.00

Work and Research Experience

NYU CILVR Lab (wp.nyu.edu/cilvr/**)** Advisor Prof. Rob Fergus — New York, NY
Research Assistant — 05/2021 - Present
- Researched Machine Common Sense (MCS) [1, 2]: designed predictive models (VGG+LSTM) that detect and localize implausible physics events by comparing observations with predictions learned from plausible physics events. (Github)
- The predictive models generated interpretable "baselines" that estimated where and how strongly physics inconsistencies occur, which helped the MCS psychology team understand how predictive models detect inconsistencies.
- Achieved 84% True Positive and 73% True Negative rates on the Gravity physics test set.

NYU MMVC Lab (mmvc.engineering.nyu.edu/) Advisor Prof. Yi Fang — New York, NY
Research Assistant — 10/2019 - 08/2020
- Innovated lightweight MLPs dynamic initialized by a PointNet for 2x faster training and fine-tuning on 3D shape correspondence tasks while retaining the same level of accuracy compared to state of the art. (Paper [3])
- Designed MobileNet-SSD based models that provide real-time (>10/s) audio feedback to help the blind maintain social distance (Paper [2]) and help the blind with collaborative hand gestures (Paper [1], Talk).
- Created *Weakly Supervised Point-to-tell* (GitHub), which trained a weakly-supervised (categorical labels only) Resnet model to localize objects being pointed to by a blind person on a synthetic dataset.

Avigilon, Motorola Solutions (avigilon.com/) — Somerville, MA
Research Engineer Intern — 06/2019 - 08/2019
- Trained and tested a specialized LeNet model that classified human false-positive detections from the camera’s security cameras. Wrote C++ code to deploy the model on camera with temporal false-positive suppression logic, reducing human false-positive detections by ~40% on proprietary test datasets.
- Modeled enhanced versions of the Kalman Filter (UKF, EKF) with C++ and Python to evaluate their potential to improve object tracking and detection when integrated into the security cameras.

Research Papers

- [1] Lu, Daohan, and Yi Fang. *Audi-Exchange: AI-Guided Hand-Based Actions to Assist Human-Human Interactions for the Blind and the Visually Impaired*. Ninth International Workshop on Assistive Computer Vision and Robotics (ACVR). 2021. View Paper, Talk@ICCV Workshop
- [2] Shrestha, Samridha, and Daohan Lu, et al. "*Active Crowd Analysis for Pandemic Risk Mitigation for Blind or Visually Impaired Persons.*" Eighth International Workshop on Assistive Computer Vision and Robotics (ACVR). 2020. View Paper
- [3] Lu, Daohan, and Yi Fang. "Meta Deformation Network: Meta Functionals for Shape Correspondence." arXiv preprint arXiv:2006.14758 (2020). View Paper