Daohan “Fred” Lu

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Education

New York University — New York, NY
College of Arts and Science — 2018 - 2021 (Expected)

- Joint Degree in Computer Science & Economics
- Cumulative GPA: 3.84

Work Experience

Avigilon, Motorola Solutions (http://avigilon.com/) — Somerville, MA
Research Engineer Intern — 06/03/2019 - 08/30/2019

- Trained and tested a specialized CNN with Tensorflow+CUDA that reduced false positives in object detection with a >300,000 image dataset. Deployed the CNN on C++ camera firmware with additional post-processing and false-positive suppression logic.
- 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 production cameras.
- As a Hackathon project, trained a LeNet model to recognize hidden patterns in order to figure out if someone copied the company’s object detection neural network model (DNN Watermarking).

NYU Multimedia and Visual Computing Lab (https://wp.nyu.edu/mmvc/) — New York, NY
Research Assistant — 10/07/2019 - 08/30/2020

- Designed novel neural networks and datasets for tasks like weakly supervised image segmentation, few-shot segmentation, 3D shape representation and segmentation, 3D meta-learning.
- Utilized Mainstream Python ML Frameworks such as PyTorch, Tensorflow, and Chainer.
- Research Paper: Meta Deformation Network on Arxiv.
- Research Paper (secondary author): *Active Crowd Analysis for Pandemic Risk Mitigation for Blind or Visually Impaired Persons* accepted to ACVR 2020. PDF here.
- Research Project: *Weakly Supervised Hand-pointed Object Detector w/ Synthesized Dataset* on GitHub.
- Research Project: *Audi-exchange: Audio-Guided Hand Actions Assistance for the Blind*. PDF here.
- Helped write proposals (e.g. NSF, NIH) for computer-vision-enabled mobile systems to assist the blind.
- Designed presentation slides to explain complex ML concepts to lay audiences.

Other Projects

- Created *Circular Anchor Single Shot Detector* on Github. Reduced bounding box complexity for higher speed.
- Created *Air Guitar with Hand Detection* on Github. A creative, educational computer vision/musical project made for Tech@NYU Freshman Circuit.
- (Under Development) *Dance X Computer Vision* on Github. A creative coding project aiming to use modern computer vision to create imaginative visual effects for dance performances.

Technical Skills

- Skilled at: Python (OpenCV, Tensorflow, PyTorch, NumPy, CuPy, Chainer, PyQt, Scikit-Learn), C++ (OpenCV, CUDA, Qt), Java (Spring, MyBatis, Android).
- Have experience with: Linux/bash, Git, Docker, Conda, JS, CSS, Swift, PHP, SQL, MatLab, IP Sockets.

Extracurricular Activities

- Co-president of 2019-2020 Freshman Circuit/TechTreks of Tech@NYU, a club that brings freshmen who are interested in tech together to work on creative projects and experience tech startups in New York City.
- E-board member of Tech@NYU. Coordinate and host events open to all NYU students centered around learning, creativity, and community. Some events include: Intro to Computer Vision, DIY Zoom Filters. Events & broadcasts can be found on Facebook, website, and Youtube.

List of Published Works

- Lu, Daohan, and Yi Fang. "*Meta Deformation Network: Meta Functionals for Shape Correspondence*." arXiv preprint arXiv:2006.14758 (2020). View Paper
- 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

List of Unpublished Works

- Lu, Daohan, and Yi Fang. *Audi-Exchange: AI-Guided Hand-Based Actions to Assist Human-Human Interactions for the Blind and the Visually Impaired*. View Paper
- Lu, Daohan, Xiang Li, and Yi Fang. *Few-Shot Segmentation for Remote Sensing Images With Metric Learning*. View Paper

Creative Computer Vision Projects

- Air Guitar with Hand Detection. Github Demo
- (In Progress) Creative Dance with Computer Vision. Github