# Catherine Horng

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## Education

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| **Cornell University** | Ithaca NY |
| **Master of Engineering**, *Computer Science* | *Dec '21* |
| **Bachelor of Arts**, *Mathematics, Computer Science* | *May '21* |

*Relevant Coursework:* Object-Oriented Programming • Data Structures & Functional Programming • Operating Systems • Intro Database Systems • Intro Analysis of Algorithms • Computer Graphics • Data Analytics • Introduction to Reinforcement Learning • Advanced Machine Learning Systems

## Experience

**AFRL Summer Research Intern** — Rome NY
*Griffiss Institute, Air Force Research Lab* — *Jun '20 - Aug '20*
- Worked with the Semi-Autonomous GMTI Exploitation (SAGE) in-house research team in the Air Force Research Lab (AFRL) to develop semi-autonomous software tools
- Incorporated transfer learning methods to classify synthetic aperture radar (SAR) images on MSTARS dataset
- Presented research to the Air Force Research Lab (AFRL) Information Directorate RIEA Activity Based Analysis Branch

**Summer Undergraduate Researcher** — Claremont CA
*Tanenbaum Research Group* — *May '18 - Jul '18*
- Designed and built a system for mapping the photovoltaic response of solar cells to analyze photovoltaic active areas
- Aided in building and analyzing perovskite solar cells for mass production using scanning electron microscope
- Worked with teams in characterizing defects of solar cells through thermoreflectance imaging and photovoltaic response

## Projects

**Software Tools for Green Fleet Management** — *Sept '21 - Current*
- Designed and developed a web-based software application to manage and track user vehicle assets and fleets using Python Flask
- Integrated tracking of emissions and costs to evaluate the potential environmental and emission impact within the management tool
- Implemented an optimization model developed to recommend fleet management decisions to reduce emissions and meet emission reduction requirements while minimizing costs

**Optimization Methods for Conditional Generative Adversarial Networks** — *Oct '21 - Dec '21*
- Researched the current state of generative adversarial network (GAN) models
- Implemented a cGAN model on a subset of Google's Quick! Draw dataset to generate synthetic computer drawn doodles
- Trained cGAN model with different optimizers (SGD, Adam, RMSProp, etc.) to determine best optimization method, analyzing with statistical and hardware measures
- Compiled research and experimental findings in a formal ICML research paper

**Transfer Learning on SAR Imaging** — *Jun '20 - Aug '20*
- Implemented transfer learning for image classification on spotlight SAR imaging from MSTARS dataset in Python with up to 97% test accuracy
- Performed experiments on different transfer learning approaches to determine viable transfer learning techniques for SAR imaging
- Performed analysis on transfer learning approaches to determine the viability of using transfer learning techniques versus standard machine learning techniques

**LBIC Mapping System** — *May '18 - Jul '18*
- Designed and built a system to map photovoltaic response of solar cells based on laser beam induced current (LBIC) to analyze defects, inactive regions, and coating errors to inform on how to improve production solar cells and provide images and data on overall photovoltaic response
- Converted laser engraver to low-power scanning laser to scan solar cells and collect photovoltaic response in CSV files to be mapped into images of photovoltaic active areas of a solar cell
- Developed a MatLab program to extract data from a scanning laser device to map the photovoltaic response from induced currents

## Skills

*Programming Languages:* R • OCaml • Java • MatLab • Julia • JavaScript • Python • PostGreSQL • HTML
*Python Packages:* SciPy • Keras • Numpy • PyTorch • Pandas • Tensorflow • MatPlotLib • Scikit-learn • Flask
*Other Skills:* GitHub • Jupyter Lab & Notebook • Intermediate Mandarin Chinese

horngcatherine.github.io | linkedin.com/in/catherine-horng