LUCAS FREY

✉ lcsfrey@gmail.com   ☎ +1 (971) 312 - 7266   🌐 lcsfrey.xyz   🐙 github.com/lcsfrey

EXPERIENCE

Machine Learning Engineer / Data Scientist
Lam Research

Jun 2019 –Present
Fremont, California

· Implemented probabilistic deep learning models to solve inverse optimization problems
· Developed image processing and computer vision algorithms to solve complex image analysis problems
· Designed high and low-level system overviews of large-scale software

Data Science Intern
Lam Research

Jun 2018 –Jun 2019
Fremont, California

· Implemented computer vision algorithms for analyzing high magnification images of semiconductors
· Developed Convolutional Neural Networks (CNNs) for image classification and segmentation
· Presented talk on CNNs to a multi-disciplinary team of engineers

Computer Science Tutor
Self-Employed

Oct 2017 –Jun 2018
Corvallis, Oregon

· Developed own curriculum to teach high school student C++ and Java programming
· Assisted student in achieving the highest score on the AP Computer Science Exam
· Taught concepts of pointers, stack vs heap, object orientation, algorithms and data structures

WORK PROJECTS

Inverse Optimization Via Sequential Time-Series Modeling
Lam Research

Jun 2019 –Present

· Developed scalable deep learning models to solve forward and inverse optimization problems
· Implemented particle swarm and gradient based optimization algorithms
· Implemented sparse models to optimize improve robustness, accuracy, memory, and power usage
· Implemented models in **Python** and **Jupyter Notebooks** using **Keras** and **Tensorflow**

Deep Learning Image Segmentation Pipeline
Lam Research

Jun 2018 –Present

· Developed pipeline for building, training, validating and deploying deep learning models
· Replicated results of academic journals on Dense, Inception, and Resnet variant CNNs
· Achieved 97% pixel 6-fold cross-validation accuracy on noisy, high magnification images
· Implemented models in **Python** and **Jupyter Notebooks** using **Keras**, **Tensorflow** and **PyTorch**

Automated Computer Vision Tools
Lam Research

Jun 2018 –Present

· Developed software used by process engineers to automatically analyze high magnification images
· Improved efficiency of engineers by automating image analysis, saving an estimate 10 hours per week
· Implemented solutions in **Python** using neural networks built using **Keras** and **Tensorflow**
· Followed the Agile software development methodology using 3 week development cycles and weekly code reviews

EDUCATION

Oregon State University   Sep 2016 –Jun 2019
Bachelor of Science   *Corvallis, Oregon*

Major Computer Science Applied in Machine Learning   Major GPA 3.67/4.0
Minor Mathematics   Overall GPA 3.58/4.0

RELEVANT COURSEWORK & AWARDS

Core Courses   **Awards**
Analysis of Algorithms & Data Structure   President's List (2 terms)
Operating Systems (Comfortable in Unix)   Dean's List (3 terms)
Software Engineering (Methodologies & Testing) Honor Roll (4 terms)
Graph Theory (Graduate level course)   Capital Manor's Foundation Scholarship (2016)
Statistics for Engineers
Linear Algebra

ACADEMIC PROJECTS

Driverless Formula Racecar   Sep 2018 - Aug 2019
Github.com/lcsfrey/OSU-Driverless-Formula-Student

· Developed deep learning computer vision and localization systems for a fully autonomous racecar
· Trained neural networks for object detection using **Python** and **PyTorch**
· Experimented with state-of-the-art architectures including Single Shot Detectors and Faster-RCNN
· Developed software to visualize, compare, and benchmark models using **Tensorboard**
· Developed software to deploy object recognition models in the **Robot Operating System (ROS)**
· Deployed models on the **NVIDIA AGX Xavier** embedded device
· Refactored team's existing **S.L.A.M.** algorithm to support multithreading
· Achieved 8th out of 20th place at **Formula Student Germany 2019 Driverless Competition**
· Achieved 6th out of 20th place in the design competition at **Formula Student Germany 2019**

Traveling Salesman Problem (TSP) Algorithms   Aug 2017 - Mar 2018
Github.com/lcsfrey/TSP_Algorithms

· Implemented genetic and multithreaded heuristic algorithms to approximate the TSP
· Outperformed entire class of 30 in 7 out of 7 competition test cases
· Implemented algorithms in **C++**
· Continued development outside of class building GUI in **Qt Creator** to display graph algorithms
· Implemented augmented reality graph overlay to display graph over drawings of graph nodes

Aces Up Solitaire Game   Oct 2017 - Dec 2017
Github.com/lcsfrey/Aces-Up

· Worked on an agile development team of 4 completing multiple 2-week sprints over the term
· Utilized **Git** version control and a branch workflow to maintain the integrity of project files
· Developed front-end and back-end systems in both mobile and desktop versions using **Java**, **HTML**, **CSS**, **JavaScript**, and the **Ninja Web Framework**

EXTRA-CIRRUCULAR

Artificial Intelligence / Machine Learning Club

· Discussed AI/ML related problems, architectures, and other topics
· Gave talks on state-of-the-art architectures deep learning architectures

Formula Racing Club

· Discussed solutions to autonomous problems involving path planning, mapping, and localization
· Participated in the Formula Student Germany and Formula Student Spain driverless racing competitions
· Presented weekly progress on driverless formula racecar project

Robotics Club

· Led team of 6 on yearlong projects to develop robots to compete in the FIRST Tech Challenge
· State finalists and two-time regional champions in competitions of 30+ teams each
· Developed autonomous systems to complete tasks utilizing touch, light, IR and rotation sensors
· Volunteered at local middle school teaching children how to build and program Lego NXT robots

PERSONAL PROJECTS

Foveated Incremental Learning Convolutional Neural Network (CNN)
Github.com/lcsfrey/Active_Learning_Pytorch

· Implemented CNN in **PyTorch** for sparse prediction of foveated images to mimic human eye
· Built using **Python**, **PyTorch**, and **OpenCV**

Augmented Reality Graph Algorithm
Github.com/lcsfrey/openCV_modules

· Created augmented reality computer vision algorithm that draws paths through graphs on paper
· Built using **Python** and **OpenCV**, **pybind11**, and **C++**

Security Camera
github.com/lcsfrey/openCV_modules

· Developed motion sensitive camera that can highlight movement in frame and write footage to files
· Built using **Python** and **OpenCV**

TECHNICAL STRENGTHS

Computer Languages	C/C++, Python, Java
Software & Tools	OpenCV, pybind11, ROS, Git, Tensorflow, Keras, Pytorch, Qt
Applied Fields	Image Segmentation, Object Detection, Automation, Model Optimization