

Reagan Kan
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Objective

A computer programmer seeking a research opportunity for the Georgia Tech MSCS program.

Education

BS in Computer Science, Georgia Institute of Technology, Atlanta, GA

August 2018 – December 2020

GPA

3.90 / 4.0

Work Experience

➤ Georgia Tech Research Institute

[Fall 2020] Student Research Assistant: Adversarial Machine Learning for PDF Malware.

- Implement the Integrated Gradients attribution method.
- Select features with robustness against adversarial attacks for PDF malware detectors.
- Write Angular unit-tests for the application user interface.

[Summer 2020] Research Intern: Adversarial Machine Learning for PDF Malware.

- Studied attacks and defenses for adversarial examples in the image & malware domains.
- Automated the Reverse Mimicry Attack, which targets PDF malware detectors. Leveraged the PeePDF tool.
- Tested the effectiveness of the automated Reverse Mimicry Attack on custom built TensorFlow PDF malware classifiers.

➤ Georgia Tech

[Spring 2020] Undergraduate Teaching Assistant: CS 2050 Intro Discrete Math.

- Graded assignments and exams, held weekly office hours, co-taught weekly recitation section.

➤ Georgia Tech Research Institute

[Fall 2019] Machine Learning Student Research Assistant: EMADE.

- Researched genetic automated machine learning (autoML).
- Integrated new evolvable computer vision tracking algorithms into GTRI's autoML framework, Evolutionary Multi-objective Automated Design Engine (EMADE).

[Summer 2019] Research Intern: EMADE.

- Began efforts to determine the plausibility of integrating a co-evolutionary approach in EMADE.
- Designed a test bed that runs genetic programming processes that mimic EMADE's behavior.
- Developed a polymorphic class that supports co-evolution, implemented using a genetic algorithm, and regular evolution.
- Wrote python scripts for generating plots and visualizations of the data collected from experiments.

➤ Georgia Tech

[Spring 2019] College of Computing Tutor:

- Helped students taking Discrete Math and Object-Oriented Programming in Java. Meetings with students were one on one and by appointment.

Projects

➤ [Fall 2020] Data & Visual Analytics Final Project

- Trained classifier with 86% test accuracy for predicting the tumor type of Neurofibromatosis patients.
- Identified drug targets for the most highly expressed genes in Neurofibromatosis patients.
- Visualized gene/tumor correlations in an interactive heatmap.

➤ [Fall 2020] Computer Vision Projects

- Hybrid Images: used image filtering to make images that change appearance at near/far viewpoints.
- Image Classification: compared neural network classifiers, three convolutional networks and a fine-tuned AlexNet, with a 15-class dataset.
- Local Feature Matching: found correspondences between two images of the same scene using a neural network that incorporates the Harris corner detector and a simplified SIFT.
- RANSAC: implemented RANSAC to estimate the fundamental matrix of image pairs.

- **[Spring 2019 – Spring 2020] Junior Design Project**
 - NLP sub-team of the Automated Algorithm Design Team, which works to expand EMADe.
 - Added stemming and lemmatization primitives.
 - Implemented architecture for multilabel classification with neural networks.
- **[Spring 2020] Deep Learning Final Project:**
 - Compared various methods for link prediction on YouTube dataset.
 - Added spectral embedding to SEAL framework, which uses Graph Neural Networks.
- **[Fall 2019] Machine Learning Final Project:**
 - Compared classification techniques, including regression, random forests, and neural networks.
 - Evaluation based on performance on Crowdsourced Mapping Data Set.
- **[Summer 2019] Sudoku:**
 - Web based Sudoku game written with Javascript.
- **[Spring 2019] Computer Organization & Programming Project, 2048 Game:**
 - A recreation of the single player puzzle game. Designed using the C language for Game Boy Advance.
- **[Spring 2019] Objects and Design Final Project, Risk Game:**
 - An adaptation of the multiplayer board game. Written with Scala and made in collaboration with four team members for the course.

Programming Languages

Python(Tensorflow, PyTorch, PySpark), Java, HTML/CSS, Javascript (D3.js), C/C++, Scala

Relevant Courses

[Fall 2020] Computer Vision, Intro to Grad Algorithms, Data & Visual Analytics, Computers & Society

[Spring 2020] Intro-Perception & Robotics, Automata & Complexity, Deep Learning, 2nd Course in Linear Algebra, Combinatorial Analysis

[Fall 2019] Systems & Networks, Design & Analysis Algorithms, Intro Artificial Intelligence, Machine Learning, Linear Algebra with Abstract Vector Spaces

[Spring 2019] Data Structures & Algorithms, Objects & Design, Computer Organization. & Programming, Applied Combinatorics

[Fall 2018] Object Oriented Programming in Java, Discrete Math, Statistics and Applications