KAI MALLOY

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EDUCATION

University of California, Irvine Graduation: Jun. 2021
Bachelor of Science in Computer Science
Specialization in Intelligent Systems
Relevant Coursework: Machine Learning and Data Mining, Algorithms for Probabilistic and Deterministic Graphical Models, Applications of Probability in Computer Science, Design and Analysis of Algorithms
GPA: 3.82/4.00

AWARDS AND RECOGNITIONS

Information and Computer Science Honors Program Sept. 2020 - Present
Summer Undergraduate Research Program Grant Jun. 2020 - Sept. 2020
Dean's Honors List Sept. 2017 - Present
Japanese Chamber of Commerce Northern California Scholarship Semi-Finalist May 2016

RESEARCH AND PROFESSIONAL EXPERIENCE

DataLab Group at UC Irvine Mar. 2020 - Present
Undergraduate Researcher *Irvine, CA*

- PI: Prof. Padhraic Smyth, Graduate Mentor: Casey Graff
- Exploring high resolution spatio-temporal learning based models with California wildfire satellite data to improve wildfire prediction accuracies
- Created multiple models utilizing recurrent and convolutional neural networks
- Built a dynamic visualization tool for analyzing various satellite data at incremental timesteps

Calit2 at UC Irvine Jan. 2020 - Present
Undergraduate Researcher *Irvine, CA*

- PI: Prof. Bill Tomlinson
- Analyze various sustainability issues and implement IT solutions that can address the problems
- Build a ruby on rails platform for simulating patent protection
- Proposed sustainability project ideas to the team

Apple Jan. 2019 - Jul. 2019
iPhone Quality Engineer Intern *Cupertino, CA*

- Compiled large amounts of iPhone Failure Analysis data and find trends by experimenting with different means of visualization
- Designed and developed two full scale applications from scripts as a lasting and user-friendly tool for other teammates
- Optimized a parsing/visualization task that took 10 minutes to run by Apple employees down to 5 seconds with my Python script
- Presented data to teammates weekly and decided on further avenues of research as well as ways to refine the data visualization through multiple iterations

Givsum Mar. 2018 - Jun. 2018
Special Projects Intern *Irvine, CA*

- Design and brainstorm features for improving user experience for the company website while incorporating feedback from teammates
- Implement a calendar view of volunteer events from scratch as a test feature for the company website

LEADERSHIP ACTIVITIES

The Green Initiative Fund Sept. 2020 - Present
Commissioner *Irvine, CA*

- Work with the TGIF student board and the Internal VP of Associate Students to fund projects from undergraduate students that promote sustainability at UC Irvine
- Advocate and spread awareness of sustainability practices on campus
- Facilitate and record weekly board meetings to decide which projects to fund
- Manage projects that have been approved by the board

TEACHING EXPERIENCE

6D Discrete Mathematics Mar. 2020 - Jun. 2020
Learning Assistant *Irvine, CA*

- Assisted professor Sandy Irani during lecture and discussion to answer student questions
- Proposed and managed an alternate solution for online students in different time zones to receive lecture participation points
- Held office hours two times a week for student questions

AppJam+ Sept. 2018 - Dec. 2018
Mobile Application Mentor *Placentia, CA*

- Taught programming concepts through mobile application development to middle school students in Orange County
- Managed a class of 30 students and their group projects from concept to completion: brainstorming, refining the app idea, splitting up tasks, creating and maintaining a schedule, teaching and advising
- Prepare students for a final showcase to show their completed mobile app

Java & AP Computer Science Jun. 2015 - Present
Private Tutor *Irvine, CA*

- Teach fundamental programming concepts learned in Java/AP Computer Science courses to high school students as a private tutor
- Pinpoint difficulties in student's comprehension to assist with programming assignments for their classes

Rivet Learning Jun. 2017 - Aug. 2017
Python Instructor *San Jose, CA*

- Managed multiple summer camp classes to teach programming with Python
- Created a curriculum from scratch, consisting of fundamental programming exercises and simple games
- Taught students of various skill levels and catered lessons accordingly

TECHNICAL SKILLS

Programming Languages	Python, Java, C, C++
Web Development	HTML, CSS, JavaScript
Machine Learning	Pytorch, Tensorflow
Data Processing and Visualization	NumPy, Pandas, Matplotlib, Seaborn, PyQtGraph, R
GUI Building	Tkinter, PyQt
Other	Linux, Git, MIPS (Assembly), LaTeX

SELECTED PROJECTS

Spatiotemporal Active Wildfire Modeling using Recurrent Neural Networks Sept. 2020
Datalab Group at UC Irvine

Existing empirical, simulation based models and machine learning models for forecasting wildfires lack integration of high temporal resolution weather and fire spread data. Through this project, I explore how the use of recurrent and convoluted neural networks capture the temporal aspects of a wildfire. The data used is the California wildfire data from the past 8 years and the models are trained using PyTorch, a python library for machine learning. The evaluation of the model is performed through comparison to a baseline convolutional neural network.

Starcraft Win/Loss Estimation Model With Skill Assessments Jun. 2020
CS 179: Algorithms for Probabilistic and Deterministic Graphical Models Final Project

In this project, I used Starcraft Win/Loss data sourced from a Kaggle Competition to analyze how well a graphical model can fair in predicting game outcome through assigning skill estimates to each player. The model constructed a table of win probabilities given two players and performs loopy belief propagation to infer player's skills. I also explored how fast a new player's skills can be estimated, strategically holding out certain players from the validation dataset and adding them in incrementally.

Classifying the Wine Quality Dataset Dec. 2019
CS 178: Machine Learning and Data Mining Final Project

Using the Wine Quality dataset from the UC Irvine Machine Learning repository, I conducted a classification experiment using two models: random forest and support vector machines. To combat overfitting, I implemented k-fold cross validation and compared the results of the two models after tweaking the hyperparameters. Random forest outperformed the SVM model with higher accuracy and lower mean squared error.

LANGUAGE SKILLS

Bilingual: fluent in Japanese (spoken, written), English