XIAOER HU

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SUMMARY

Ph.D. candidate of **EECS** at **UC Berkeley** with strong programming, analytical and math skills, and extensive experience in machine learning, computer science and data science. Seeking **full-time** machine learning position starting **May 2022**

SKILLS

Programming Languages: Python (NumPy, Scikit-learn, Pandas, PySpark), SQL, Java, C++, MATLAB
Tools and Packages: Git, Databricks, TensorFlow, Keras, PyTorch, Tableau
Machine Learning: CNN, NLP, LSTM, SVM, kNN, decision trees, random forest

EDUCATION

University of California, Berkeley Berkeley, CA, U.S. GPA: 4.00/4.00
Ph.D. and ***M.S.*** in Electrical Engineering and Computer Sciences, ***Certificate*** in Data Science 08/2017-05/2022

University of Michigan Ann Arbor, MI, U.S. GPA: 3.92/4.00
B.S.E. in Materials Science and Engineering, ***Minor*** in Electrical Engineering 09/2015-04/2017

Shanghai Jiao Tong University Shanghai, China GPA: 3.55/4.00
B.S.E. in Electrical and Computer Engineering 09/2013-08/2017

WORK EXPERIENCE

Data Science Internship — Applied Materials, Santa Clara, CA 07/2020-09/2020

- Implemented semi-supervised deep learning methods with different neural networks including autoencoder, deep long short-term memory (LSTM) and sequence to sequence LSTM for a web application used in detecting real-time anomalies for multivariate time series sensor data during microchips fabrication processes by Keras and TensorFlow
- Implemented unsupervised learning methods to efficiently detect real-time anomalies on fabrication equipment sensor data with more than 15 models including isolation forest, k-nearest neighbors (kNN), support vector machines (SVMs) and ensemble methods, using automated machine learning techniques
- Built a framework to enable structured comparisons of all anomaly detection algorithm performance

RESEARCH PROJECTS AND TEACHING EXPERIENCE

Research on Computer Vision -- Recent Advances in Sports Computer Vision 01/2021-Present

- Targeted at creating synthetic multi-view videos from different camera directions and angles by 3D reconstruction of multi-player broadcast sports footage
- Led a team of three, demonstrated end-to-end 3D reconstruction of soccer scenes using frame by frame analysis by generating bounding boxes for each player per frame using MaskRCNN, estimating 2D pose keypoints using OpenPose, producing 3D human poses and camera parameters using Human Mesh Recovery (HMR), and combining homography estimation and camera calibration information
- Targeted at evaluating the performance of different video analysis architectures for multi-classification of broadcast footage to predict baseball pitching using more than 4000 Major League Baseball videos on YouTube
- Evaluated the performance of video analysis architectures including SlowFast, Inceptionv3 and I3D in predicting the labels of actions observed in baseball videos and determined the architecture with highest mean average precision/cost

Graduate Student Instructor at UC Berkeley -- ***Applied Data Science with Venture Applications*** 01/2021-05/2021

- Designed programming/software assignments on data science topics including Regression, Classification, Time Series, Neural Network, Convolutional Neural Network (CNN), Natural Language Processing (NLP) and Tableau
- Gave lectures to 170 students on data science and machine learning related topics
- Mentored 11 groups of students on projects involving real-world data science applications by offering weekly group meetings, office hours and code reviews

Deep Reinforcement Learning (RL) -- Dynamic Curriculum Learning for Deep RL Agents 08/2020-12/2020

- Led a team of three, targeted at creating efficient RL algorithms to facilitate learning process across several RL tasks from OpenAI gym including Car racing, Lunar lander and Cart pole using PyTorch
- Achieved 3-times-faster and more stable learning behaviors that outperformed baselines for RL agents by designing novel curriculum learning environments with varied state transition dynamics, ranging from “easy” environments to “hard” environments that are closer to the real world

Data Visualization and Analysis -- Predictions on California Road Accidents Severity 01/2020-05/2020

- Led a team of three, fetched and cleaned 3 million US traffic accident records from February 2016 to December 2019 to predict severity of road accidents for effective accident management to increase traffic safety and decrease injuries
- Achieved 93% accuracy for predictions of California road accident severity using machine learning methods including kNN, decision trees, random forest and SVMs; analyzed model hyperparameters and machine learning tricks in depth

SELECTED FIRST-AUTHOR PUBLICATIONS

1. **X. Hu,** et.al. *2019 IEDM*. ***Featured*** in IEEE Spectrum.
2. **X. Hu,** et al. *2021 IEDM*.