

Ryan David Melzer

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Education

M.S. Computer Science

The University of Arizona, expected December 2020 (4.0/4.0 GPA)

Emphasis in Machine Learning and Artificial Intelligence.

Graduate coursework: Machine Learning Theory, Probabilistic Graphical Models, Algorithms for Natural Language Processing, Computer Vision, Neural Networks, Advanced Operating Systems, Human-Computer Interaction

B.S. Computer Science

The University of Arizona, 2017 (4.0/4.0 Major GPA)

B.S. Mathematics

The University of Arizona, 2017

Experience

Graduate Research Assistant - The University of Arizona. Tucson, AZ

Spring 2019 - Present

Research in novel online learning and multi-armed bandit algorithms.

Using unsupervised learning techniques for outlier detection in streaming astronomical data from the Large Synoptic Survey Telescope. (Python, C++, scikit-learn, mlpack)

Developed neural models and probabilistic pattern recognition techniques for music generation and improvisation (2019 academic year). (Python, scikit-learn, PyTorch)

Research Intern - Sandia National Laboratories. Albuquerque, NM

Summer 2019

Developed deep learning models for pose estimation and object recognition to run onboard autonomous flight platforms using synthetic aperture radar. Utilized state of the art convolutional neural network architectures, meta-learning techniques, and image processing techniques. (Python, PyTorch, OpenCV, scikit-learn)

Built a perception system for guidance, navigation, and object detection to run on custom quadcopters. (C++, Python, PyTorch, OpenCV, scikit-learn, Linux, ROS)

Acquired subject matter expertise in deep learning and computer vision. Read and reviewed many of the historically important publications, as well as the latest publications to stay up to date in state of the art techniques.

Software Engineer I - Optiver. Chicago, IL

July 2017 - May 2018

Full-cycle development of high-frequency trading applications each of which make thousands of trades a day. Wrote robust and optimized code to parse and react to thousands of incoming market data packets per second from 13 exchanges across the US. (C, C++, Java, Unix)

Extended an in-house end-to-end testing framework to cover new applications, features, trading strategies, and exchanges. (Python, Ruby, Unix)

Developed real-time post-trade analysis tools to analyze automated trading strategy decisions which allowed the company to test and deploy new trading strategies at scale safely. (C#, Python)

Software Engineering Intern - Optiver. Chicago, IL

Summer 2016

Developed a server to make option volatility simulations using forecasted market fluctuations and changes in pricing model parameters. The server computed large matrix operations in parallel for thousands of options and broadcasted the results on a local UDP network. (C#)

Developed a server for real-time monitoring of work queues in the data collection and processing system. The server was able to easily identify bottlenecks across each component of this system in real-time. (C#)

Added many features to a large system which extracted and stored timestamped real-time, post-processed data from the trading system. (C#, Python)

Research Engineering Intern - Rincon Research Corporation. Tucson, AZ

Summer 2015

Created a geolocation algorithm for autonomous multicopter drone clusters. (Python, C++, Unix)

Developed an onboard radio system for target detection and location which interfaced drone control APIs with drone autopilot software and software-defined radios. (Python, C++, Unix)

Created a mesh network for communication between multicopters in the system using mounted single board computers. (Python, Raspberry Pi)

Teaching Assistant - The University of Arizona. Tucson, AZ

Graduate TA: Automata, Grammars and Languages

Fall 2018 (25 students)

Graduate TA: Software Development in C++

Fall 2018 (25 students)

Undergrad TA: Analysis of Discrete Structures

Spring 2016 (70 students)

Undergrad TA: Introduction to Computer Science II

Spring 2015 (115 students)

Skills

Programming Languages: Python, C/C++, Bash, C#, Java, JavaScript, HTML, CSS, MATLAB

Tools: Git, Visual Studio

Frameworks and Libraries: PyTorch, scikit-learn, OpenCV

Other Accomplishments

Lead guitarist, founding member, and composer for a regionally successful band

Produced multiple records and performed across the southwestern United States