Trace Tidwell

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INTERESTS

Applying knowledge from computer science and engineering to solve cutting-edge problems in artificial intelligence and machine learning.

EDUCATION

Georgia Institute of Technology August 2018 - May 2020
MS in Computer Science, Machine Learning Track, 3.80 GPA

Kennesaw State University August 2017 - May 2018
Graduate Certificate in Computer Science Foundations, 4.0 GPA

Georgia Institute of Technology August 2003 - December 2008
BS in Mechanical Engineering

EXPERIENCE

SkyMul, Atlanta, GA May 2019 - August 2019
Machine Learning Intern
Worked on computer vision system for startup using drones to tie rebar for construction applications

- Used transfer learning on pretrained RetinaNet model with ResNet50 backbone for detecting rebar intersections
- Implemented SORT object tracker to track detected rebar intersections
- Achieved processing rate of 20 frames per second (FPS)
- Developed ROS launch files to start RealSense tracking and depth cameras and run object tracking model
- Next steps were to use DenseNet and MobileNet backbones in hopes of achieving real-time (30 FPS) detection and tracking

Emerson, Atlanta, GA May 2018 - August 2018
Innovation Technologist Intern
Explored new technologies and their practical applications

- Developed predictive maintenance model to detect anomalies and prevent failures
  - Develop pipeline for obtaining and cleaning data using pandas, scikit-learn, and SQLAlchemy
  - Trained neural network and tuned hyperparameters using scikit-learn and Keras
  - Automated daily predictions, analyzing and storing results, and sending necessary alarms
- Explored Blockchain for supply chain management with Chick-fil-a, Dover, and ATT
  - Downloaded GPS and temperature data from Emerson's GO Tracker API
  - Developed web API using Flask-RESTful for interacting with IBM Blockchain
  - Simulated being a shipping company, received orders from Blockchain, wrote status updates to Blockchain including delivery status, location, and temperature data

Southwire Company, Carrollton, GA January 2016 - April 2017
Mechanical Engineer
Managed projects of increasing size and complexity

- Security upgrades for facility ($100,000)
- Renovation of facility including new break room and offices ($300,000)
- Repair and expansion of facility ($1,000,000), resulting in annual savings of $500,000

Southwire Company, Carrollton, GA August 2014 - December 2015
Specifications Engineer
Assisted in the design and implementation of Southwire's Manufacturing Specification System

- Developed method for creating plant alternatives that cut processing time in half, saving weeks
- Created process for updating database table that reduced working time from 1 day to 2 hours
- Programmed formulas to calculate product specifications in JavaScript and SQL

Southwire Company, Carrollton, GA September 2013 - July 2014
Development Engineer
Researched and developed new products

- Brought two new mining cable products to market

ThyssenKrupp Resource Technologies, Atlanta, GA Jan 2009 - August 2013
Mechanical Engineer
Designed and installed equipment for the cement manufacturing and mineral processing industries

- Created CAD drawings, 3D models, and bills of materials for new and existing equipment
- Performed inspections and oversaw the installation and servicing of equipment
- Completed 2 year training program in Germany specializing in grinding technology

RESEARCH

Georgia Institute of Technology August 2019 - present
CopyCat
Working with Thad Starner to develop a game/app to assist in the learning of sign language, primarily for deaf children and their (usually hearing) family members. Using Machine Learning and Computer Vision techniques to interpret signs from video data.

Georgia Institute of Technology October 2018 - August 2019
Multidirectional Search
Working with Thad Starner to explore the effectiveness of a multidirectional heuristic search for finding the shortest path connecting $n > 2$ points as compared to performing n separate, point-to-point searches and determining the best path.

TEACHING

Georgia Institute of Technology August 2020 - present
Head Graduate Teaching Assistant
CS6601: Artificial Intelligence

- Lead team of TAs to oversee both online and on-campus sections totaling 500+ students
- Oversee midterm and final exam creation and development of assignments
- Hold weekly office hours
- Participate in online message boards to answer students' questions

Georgia Institute of Technology January 2019 - May 2019
Graduate Teaching Assistant
CS6601: Artificial Intelligence

- Updated, oversaw, and graded Assignment 2 Search
- Created and graded questions for midterm / final exam
- Hold weekly office hours
- Participate in online message boards to answer students' questions

PROJECTS

Tetris: Trained agent to play Tetris agent using Noisy Cross-Entropy Method that averaged over 12,000 lines and achieved a best-score of over 38,000 lines.

Sumo Ants: Trained agents using self-play and Soft Actor-Critic to compete in the Sumo Challenge from OpenAI Multi-agent Competition Environment.

Deep-Metamorphose: Training an agent to create 3D artwork that displays different images from different angles (i.e. from the front and the left).

Self-Supervised Context Learning in 3D: Developing model to learn visual representation from unlabeled 3D dataset. To be tested on downstream object classification or detection tasks.

SKILLS

Programming: Python (NumPy, pandas, scikit-learn, Flask, SQLAlchemy, Keras) [int], SQL [int], Java [beg], Git [int]
Language: German [adv]