

Zhuohan Zeng

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Experience

Builders Connection Ltd.

Data Engineer

Houston, Texas

Sep 2019- Aug 2020

- Working on the Data Platform team. Built a house for sale data storage system on top of Spark SQL, and supported fast index lookup with Elasticsearch.
- Built user profiles with Random Forest and Gradient Boosting Decision Tree, and designed a model of user buying behavior with Hidden Markov Model.

University of Massachusetts at Amherst

Research Assistant

Amherst, Massachusetts

May 2019-Aug 2019

- Designed a reinforcement learning based collision avoidance algorithm to perform mapless navigation for robot vehicle. Vehicle localized by Pose-Graph SLAM with Robot Operating System. Designed complex training environments including LIDAR points cloud and realistic pedestrian crowd trajectory.
- Designed an online learning algorithm to improve vehicle the motion planning, which helps the vehicle recover quickly from unexpected pedestrian behavior.
- The combined collision avoidance algorithm was tested on TurtleBot2 to prove feasibility and efficiency.

Carnegie Mellon University

Research Assistant

Pittsburgh, Pennsylvania

May 2018-Aug 2018

- Implement a multi-agents reinforcement learning algorithm to address the multi robots control problem in social dilemma scenario. Trained agents showed complicated cooperate strategies such as fighting cheaters together in a fully decentralized training approaches.

Projects

Replicated Consensus-based Storage System by RAFT

Mar-May 2019

- Implemented RAFT protocol from scratch for a distributed fault-tolerant storage service, including leader election and consensus voting. Storage system provide strong consistency where each application call observes the modifications implied by the preceding sequence of calls.

Collision Avoidance Multi-Robot Navigation

March-May 2019

- Reproduced paper "ALAN: adaptive learning for multi-agent navigation" in Python, in which agents (group of robots) need to navigate to their target position without collision under decentralized control, and adapt to local environment with online learning.
- Implemented multi-agent proximal policy optimization and by combining with optimal reciprocal collision avoidance (ORCA) algorithm, robots are able to navigate 16.3% faster than ALAN.

Robust Image Classification Using Spiking Neural network

Aug-Dec 2018

Design a image classifier robust to noise and adversarial examples

- Implemented a spiking neural network (SNN) with spike-timing-dependent plasticity local learning rule.
- Compared to standard CNN, our system shows better robustness in several tests against noise. In a black-box adversarial attack (boundary attack) on SNN. The Average distance (in L2-metric) between adversarial and the original image of SNN is 2.76 times larger than that of CNN.

Skills

- Programming Languages: Python, C++, R
- Tools and Frameworks: Tensorflow, PyTorch
- Industry Knowledge: Database, Machine Learning
- PostgreSQL, Shell, Git, Docker
- Natural Language Processing, Artificial Intelligence
- Robotics

Education

University of Massachusetts at Amherst

Master in Computer Science, GPA: 3.95/4.0

Amherst, MA

2017-2019

Sun Yat-Sen University

Bachelor in Information and Computing Science, GPA: 3.5/4.0

Guangzhou, China

2013-2017

Sun Yat-Sen University

Bachelor in Biological Science, GPA: 3.5/4.0

Guangzhou, China

2012-2016