Zhuohan Zeng

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Experience

Builders Connection Ltd. **Houston, Texas**
Data Engineer *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 **Amherst, Massachusetts**
Research assistant *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 environments for vehicle to interact with, including simulated LIDAR observation and moving obstacles such as a pedestrian crowd with realistic movement trajectory.
- Implemented an online learning algorithm to optimized vehicle controller in order to learn quickly from unexpected human behavior.

Projects

Replicated Consensus-based Storage System by RAFT
Implemented a Fault-tolerant key/value storage system *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.

Robust Image Classification Using Spiking Neural network
Design a image classifier robust to noise and adversarial examples *Aug-Dec 2018*

- Implemented a spiking neural network (SNN) with spike-timing-dependent plasticity local learning rule.
- Performed multiple robustness test on SNN to prove the robustness. Such as replace half of the pixels by the random value, SNN retaining an accuracy of 53.5% while a two-layer CNN has dropped to 26.3%.
- Performed 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.

Interactive Data Exploration
Develop a data exploration framework to help user retrieve target data *Jan-Apr 2018*

- Designed an interactive data exploration framework, which exploits feedback to helping users targeting their interesting datasets through iteratively predicting. Predicted user interest by decision tree trained with feedback data in each exploration iteration.
- Implemented an efficient exploration process to identifying relevant entries from unexplored data areas by dividing the data area into hierarchical grids.

Skills

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

Education

- **University of Massachusetts at Amherst** **Amherst, MA**
  Master in Computer Science, GPA: 3.95/4.0 *2017–2019*
- **Sun Yat-Sen University** **Guangzhou, China**
  Bachelor in Information and Computing Science, GPA: 3.5/4.0 *2013–2017*
- **Sun Yat-Sen University** **Guangzhou, China**
  Bachelor in Biological Science, GPA: 3.5/4.0 *2012–2016*