SHENGAN ZHANG

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EDUCATION

University of Michigan (UM), Ann Arbor, MI, USA

College of Engineering (CoE)

B.S.E in Computer Science, Minor in Mathematics — Expected May 2021

Cumulative GPA: 3.95 / 4.0

Shanghai Jiao Tong University (SJTU), Shanghai, China

University of Michigan – Shanghai Jiao Tong University Joint Institute (UM – SJTU JI)

B.S in Electrical and Computer Engineering — Expected August 2021

Cumulative GPA: 3.71 / 4.0, Rank: 35/253

RESEARCH PROJECTS

Data Elements from Video using Impartial Algorithm Tools for Extraction — May 2020 – Present

Supervised by Dr. Carol Flannagan, Ann Arbor, MI

- Developed and tested algorithms to detect the position of hand primitive in vehicle-monitoring videos, which would be a baseline component for next-stage cell phone usage detection algorithm.
- Reduced misdetection of hand position in cabin-view videos by implementing a background-removal algorithm based on Optical Flow masking.
- Reimplemented the User Interface for a labeling software with PyQt5, which adopted a tree structure to indicate the relationship between objects in video frames and led to better labeling experience.
- Tested on SHRP2 dataset the generalizability of a 3D ConvNet model, which was trained and fine-tuned on IVBSS dataset.
- Trained a 3D ConvNet model on face-view videos to evaluate the model's performance on the extraction of cell-phone-related behaviors.
- Cooperated with a peer researcher to work on a paper "*Driver Behavior Extraction from Videos in Naturalistic Driving Datasets with 3D ConvNets*" (in submission).

Data Augmentation based on Invariant Transform Experience Replay — May 2020 – August 2020

Supervised by Dr. Paul Weng, Dr. Matthieu Zimmer, Shanghai

- Self-learned Deep Reinforcement Learning (RL) theory.
- Tested the original RL data augmentation method, which made symmetries of multi-task robot manipulator's trajectories and targets, with DDPG model on tasks from OpenAI Gym.
- Proposed a method of randomly sampling reflection angles and choosing best angles based on the temporal difference errors of the corresponding symmetric trajectories to enhance the effectiveness of data augmentation.

Analyzer of Leg Movement Based on Wireless Transmission — June 2018 – November 2019

Supervised by Dr. Guohua Shu, Shanghai

- Co-developed algorithms leading to real-time leg movement visualization based on MPU-6050 acceleration sensors and STM-32 board.
- Preprocessed acceleration data to eliminate noise and designed algorithm to simulate the trajectory of leg with these data in MATLAB.

HONORS & AWARDS

UM CoE Dean's List, University Honors January 2020

The Dean's Honor List recognizes UM students that have 3.5 GPA or better for the term.

Tang Junyuan UM – SJTU JI Scholarship August 2019

The scholarship of the highest level in UM – SJTU JI (Top 1% in UM – SJTU JI).

China National Scholarship November 2018

The scholarship of the highest level in China (Top 0.2% in China).

UM – SJTU JI Academic Writing Contest, 2nd Prize December 2018

The award to recognize my essay "*Would Zhuangzi Agree with Himself?*" (Top 1% in UM – SJTU JI).

A-level Excellent Undergraduate Scholarship November 2018

This is to award SJTU students for excellent academic performances (Top 1% in UM – SJTU JI).

Shanghai Jiao Tong University Outstanding Student October 2018

This scholarship recognizes students of outstanding overall performance.

LEADERSHIP

UM - SJTU JI Student Union, Vice President of the Presidium June 2018 – June 2019

Took the overall responsibility of UM – SJTU JI Student Union and lead all the departments to hold events such as sports competitions, town hall meeting and career orientation to improve JI students' life.

TEACHING

VG 100 Introduction to Engineering, Teaching Assistant May 2020 – August 2020

Offered by Dr. Manuel Charlemagne, Dr. Michelle Campbell, Shanghai

- Cooperated with other teaching assistants to grade assignments and provided feedback to students.
- Held office hours to help students perform better and learn more efficiently.
- Collected students' ideas and provided them for the instructors to improve this course.

COURSE EXPERIENCES

EECS 498 Deep Learning for Computer Vision September 2020 – December 2020

Offered by Dr. Justin Johnson, Ann Arbor, MI

- Implemented an image captioning model based on RNN, LSTM and Attention mechanism.
- Built an anchor-based single-stage object detector similar to YOLO and a two-stage object detector, similar to Faster R-CNN, that combined a region proposal network with a recognition network.
- Developed two different kinds of generative models: Variational Autoencoders and Generative Adversarial Networks.

EECS 445 Introduction to Machine Learning January 2020 – April 2020

Offered by Dr. Sindhu Kutty, Ann Arbor, MI

- Built a text classifier based on RBF-kernel SVM and ran fine-tuning.
- Designed an image classifier based on CNN with data augmentation and fractional-max-pooling.

EECS 482 Introduction to Operating Systems, Advanced Version January 2020 – April 2020

Offered by Dr. Harsha V. Madhyastha, Ann Arbor, MI

- Built a thread library to support multi-threaded programming for both uniprocessor and multiprocessor systems.
- Implemented a pager to manage application processes' virtual address spaces.
- Developed a multi-threaded network server for file management in client-server systems.