

# SHENGAN ZHANG

500 S. State Street, Ann Arbor, MI 48109, USA, +1 7345480037 | zshengan@umich.edu  
shenganzhang.github.io

## 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

---

<b>College of Engineering Dean's List, University Honors</b>	January 2020
The Dean's Honor List recognizes UM students that have 3.5 GPA or better for the term.	
<b>Tang Junyuan UM – SJTU JI Scholarship</b>	August 2019
The scholarship of the highest level in UM – SJTU JI (Top 1% in UM – SJTU JI).	
<b>China National Scholarship</b>	November 2018
The scholarship of the highest level in China (Top 0.2% in China).	
<b>UM – SJTU JI Academic Writing Contest, 2nd Prize</b>	November 2018
The award to recognize my essay “ <i>Would Zhuangzi Agree with Himself?</i> ” (Top 1% in UM – SJTU JI).	
<b>A-level Excellent Undergraduate Scholarship</b>	November 2018
This is to award SJTU students for excellent academic performances (Top 1% in UM – SJTU JI).	
<b>Shanghai Jiao Tong University Outstanding Student</b>	October 2018
This scholarship recognizes students of outstanding overall performance.	

## LEADERSHIP

---

<b>UM - SJTU JI Student Union, Vice President of the Presidium</b>	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

---

<b>VG 100 Introduction to Engineering, Teaching Assistant</b>	May 2020 – August 2020
<i>Offered by Dr. Manuel Charlemagne, Dr. Michelle Campbell, Shanghai</i>	
<ul style="list-style-type: none"><li>Cooperated with other teaching assistants to grade assignments and provided feedback to students.</li><li>Held office hours to help students perform better and learn more efficiently.</li><li>Collected students' ideas and provided them for the instructors to improve this course.</li></ul>	

## COURSE EXPERIENCES

---

<b>EECS 498 Deep Learning for Computer Vision</b>	September 2020 – December 2020
<i>Offered by Dr. Justin Johnson, Ann Arbor, MI</i>	
<ul style="list-style-type: none"><li>Implemented an image captioning model based on RNN, LSTM and Attention mechanism.</li><li>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.</li><li>Developed two different kinds of generative models: Variational Autoencoders and Generative Adversarial Networks.</li></ul>	
<b>EECS 445 Introduction to Machine Learning</b>	January 2020 – April 2020
<i>Offered by Dr. Sindhu Kutty, Ann Arbor, MI</i>	
<ul style="list-style-type: none"><li>Built a text classifier based on RBF-kernel SVM and ran fine-tuning.</li><li>Designed an image classifier based on CNN with data augmentation and fractional-max-pooling.</li></ul>	
<b>EECS 482 Introduction to Operating Systems, Advanced Version</b>	January 2020 – April 2020
<i>Offered by Dr. Harsha V. Madhyastha, Ann Arbor, MI</i>	
<ul style="list-style-type: none"><li>Built a thread library to support multi-threaded programming for both uniprocessor and multiprocessor systems.</li><li>Implemented a pager to manage application processes' virtual address spaces.</li><li>Developed a multi-threaded network server for file management in client-server systems.</li></ul>	