

# Zhengyu Wu

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<https://zhengyu-wu.github.io>

## EDUCATION

### Shanghai Jiao Tong University (SJTU)

Sept. 2015 - Jun. 2020 (expected)

School of Electronic Information and Electrical Engineering

Shanghai, China

- B.S. in Software Engineering
- GPA: 86.72/100

### University of California, San Diego (UCSD)

Jul. 2019 - Sept. 2019

Summer Research Internship, Department of Cognitive Science

La Jolla, USA

## AREAS OF INTEREST

Data Science, Machine Learning, Natural Language Processing

## PUBLICATIONS

Li, Xuecheng, **Zhengyu Wu**, and Ting Han. "Gamification-Based VR Rowing Simulation System." International Conference on Human-Computer Interaction. Springer, Cham, 2019. [\[paper\]](#)

**Zhengyu Wu**, Yan Sun, et al. "A Method to Diagnose Discoid Lateral Menisci on Radiographs Using Image Processing Tools and Machine Learning". Knee Surgery, Sports Traumatology, Arthroscopy (Under review)

**Zhengyu Wu**, Ruhui Ma. "A Novel Sybil Attack Detection Scheme Based on Edge Computing for Mobile IoT Environment". [\[arxiv\]](#)

## RESEARCH EXPERIENCE

### Pain Detection via EEG Signals, Face Videos, and Human Postures

Jul. 2019 - Sept. 2019

*Supervised by Prof. Virginia de Sa (UCSD)*

- Programmed LED flashing patterns with Arduino to represent unique numbers which matched the fps of a GoPro video camera
- Recognized LED patterns in video frames by computer vision methods
- Synchronized EEG signals and video frames in order to exploit brain physiology to guide machine learning algorithms
- Built a two-stage multi-task deep learning model via PyTorch for pain detection in face videos which achieved MAE 1.95 and ICC 0.43 on McMaster Dataset

### Gamification-Based VR Rowing Simulation System

Oct. 2018 - Jan. 2019

*Supervised by Prof. Ting Han (SJTU)*

- Wrote C# programs on Unity platform to connect HTC Vive handles and helmet with a mechanical rowing machine
- Drew a number of boats with a certain speed as competitors in the scene
- Explored new paths in professional rowing training using human-computer interaction and brought in gamification theory in sports training

### Diagnosis of A Kind of Knee Disease by Machine Learning Methods

Apr. 2018 - Sept. 2018

*Supervised by Prof. Yan Sun (SJTU)*

- Flipped, rotated and translated x-ray images from Renji Hospital Affiliated to Shanghai Jiao Tong University School of Medicine for data augmentation
- Employed an object detection model, YOLO, to crop X-ray images
- Processed images by morphological methods like eroding and dilating operations and used Canny and Sobel operators to realize image fringe detecting and picking up

### Visual Question Answering Model Based on GAN

Nov. 2017 - Nov. 2018

*Supervised by Prof. Ruhui Ma (SJTU)*

National Undergraduate Innovation Program

- Proposed a deep learning model based on GAN which projected answers along with fusions of

image features and question features into a latent space for semantic alignment

- Achieved state-of-the-art BLEU results on short answers of VQA 2.0 dataset

### Detecting Sybil Attack in Mobile IoT

Oct. 2016 - Oct. 2017

*Supervised by Prof. Ruhui Ma (SJTU)*

- Proposed a lightweight detection scheme based on cloud computing against Sybil attack in IoT
- Wrote 2000+ lines of C++ codes to complete the entire code work and test the designed scheme in a simulation environment
- Achieved more than 90% detection rate with little memory overhead and communication overhead

## SELECTED COURSE PROJECTS

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### Commodity Trade WEB System [\[video\]](#)

Apr. 2019 - Jun. 2019

- Built a WEB system which simulated a commodity trade system including Trader UI, Trader gateway, Broker UI and Broker gateway
- Realized many features such as real-time message notification, separating large orders, authentication and authorization
- Employed technical stack including React, SpringBoot, MYSQL, MongoDB, Redis, Kafka, and Docker

### Smart Garden Android & iOS APP [\[video\]](#) [\[code\]](#)

Jun. 2018 - Sept. 2018

- Developed an APP called Smart Garden which allowed users to manage the nozzles of their private gardens by cellphones
- Implemented the application based on React Native (front end), SpringBoot (back end) and Mysql (database)
- Distributed sensors in a garden to get real-time temperature and moisture according to which an algorithm was applied to coordinate nozzles automatically in the garden

### Key-Value Database Based on B+ Tree [\[code\]](#)

Jun. 2017 - Sept. 2018

- Implemented a key-value database by C++ which supported basic CRUD operations
- Employed B+ tree data structure to store data and provided many features like cache, buffer, and space recycle

## HONORS & AWARDS

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Hongyi Scholarship (10 students selected across SJTU, 25,000 CNY)	2019
Wish Company Scholarship (Top 2%, 12,000 CNY)	2018
4th Place in Odyssey of the Mind Competition Finals in Iowa, USA	2018
SJTU Scholarship for Oversea Study (4,000 CNY)	2019
Second National Prize in China Undergraduate Mathematical Contest in Modeling (Top 1%)	2017
Academic Excellence Scholarship of SJTU (Top 10%, twice)	2016 & 2018
Excellent Student Cadre of SJTU (Top 0.5%, twice)	2016 & 2017

## MISCELLANEOUS

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**Leadership:** President of Housing Management Committee in SJTU, Class Monitor

**Computer Skills:** Python, C++/C, PyTorch, MATLAB, Latex, MySQL, Java, SpringBoot

**Hobbies:** Body-building, Basketball, Guitar, Swimming, Traveling, Photography