

# ShiHan Zhan (詹士翰)

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## EDUCATION

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**University of Michigan-Shanghai Jiao Tong University Joint Institute**    09/16–Present  
B.Sc. in Electrical and Computer Engineering    GPA: 3.39/4.00  
*Relevant courses: calculus, data structure, algorithms, cryptography, operating system, logic design, computer organization.*

**University of California San Diego**    08/18–12/18  
Exchange student (Department of Computer Science)  
*Relevant courses: advanced data structure, computer vision, software engineering, database system principle.*

## PUBLICATION

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**A paper in information theory submitted to NeurIPS 2020**

## HONORS & AWARDS

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Dean's list    summer 2016, fall 2017  
Shanghai Baosteel Scholarship    2018  
Second Prize of Hong Kong, Macao and Taiwan Scholarship    2018, 2020  
Toefl: 107 GRE: 321

## RESEARCH EXPERIENCE

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**Institute of Image Communication and Network Engineering, SJTU**    04/19–Present

Advisor: [Zhai Guang Tao](#)

Project: [Alzheimer's patients on maze exploring](#)

- Creating randomly generated mazes for Alzheimer's patients to walk through and collect data.
- Training a reinforcement learning (deep Q-learning) model to represent these Alzheimer's patients and let the model test different mazes.
- Researching on what kinds of mazes are easier for Alzheimer's patients to go through.
- Applying these friendlier mazes' designs to new buildings, so Alzheimer's patients are not easy to get lost.

**Wireless Networking and Artificial Intelligence Lab, UM-SJTU JI**    04/18–08/18

Advisor: [Wang Xudong](#)

- Using image normalization, resizing, cropping, and de-noising to pre-process the human face's image data (with age and gender labels).
- Training different neural networks and performing age prediction and gender classification.

## WORKING EXPERIENCE

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**SenseTime, Shanghai**    12/18–03/19

Artificial Intelligence (AI) research intern

Advisor: [Cheng Li](#)

Project: [Using reinforcement learning \(RL\) to calculate the maximum distance of a ball thrown by resistance motors](#)

- A system composed of two resistance motors can throw a ball after a period of swinging.
- Using different RL algorithms to calculate the maximum horizontal distance of the ball.
- Visualizing the process of throwing ball
- Let users adjust the motor's torque to perform ball throwing for imitation learning.
- Using RL to achieve near optimal solution for a difficult to solve problem.

Project: Artificial intelligence introduction text book.

- Co-author with one teammate to create an AI introduction text book for high school students.

## **TEACHING EXPERIENCE**

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Teaching assistant for Calculus I	Advisor: Prof. Zachiri McKenzie	08/17–12/17
Teaching assistant for Calculus II	Advisor: Prof. Zachiri McKenzie	02/18–05/18
Teaching assistant for Calculus III	Advisor: Prof. Zachiri McKenzie	05/19–08/19
Teaching assistant for Semiconductor Devices	Advisor: Prof. Yaping Dan	05/20–Present

## **SCHOOL PROJECT**

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[Introduction to Cryptography](#) 05/19–08/19

- Implemented encryption and decryption of AES with 16-bit keys and RC4.
- Researched unicity distance and Shannon's theory of cryptography.
- Researched the multiple polynomial quadratic sieves.

[Advanced Data Structure](#) 08/18–12/18

- Implemented a binary search tree and KD tree.
- Implemented a string auto completer by Trie and a document generator by Markov method.
- Implemented decomposition of k-cores to study different user's relationships in a graph.

[Introduction to Computer Vision](#) 08/18–12/18

- Implemented 2D Fourier transform, Harris corner detector, and different feature descriptors.
- Implemented 3D reconstruction by an eight-point algorithm, metric reconstruction function.
- Implemented iterative KLT tracker to track a specific object in an image sequence.
- Performed image classification by different networks and promoted the accuracy.

[Single-cycle and pipelined CPU's implementation and simulation.](#) 05/19-08/19

- Used Verilog to develop a single-cycle and a pipelined CPUs with forward and hazard detection.

## **SKILLS**

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Programming: C (advanced), C++ (advanced), Python (advanced), MATLAB(intermediate), Verilog (intermediate), Java (intermediate)

Deep learning framework: Tensorflow (intermediate), Kera (advanced), Pytorch (advanced), Caffe (intermediate)

Tools: LaTeX (advanced), Git (intermediate), Shell (advanced), Django (beginner)

Note: Skills are divided into four levels (beginner, intermediate, advanced, expert)

# 詹士翰(ShiHan Zhan)

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## 教育背景

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上海交通大學密西根聯合學院	09/16–Present
本科生(電子與計算機工程)	GPA: 3.39/4.00

美國加州大學聖地牙哥分校	08/18–12/18
交換生(計算機科學)	

## 論文發表

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NeurIPS 2020 一篇信息論相關的文章在投

## 榮譽獎項

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Dean's list	夏季 2016, 秋季 2017
上海寶鋼獎學金	2018
Toefl: 107 GRE: 321	

## 研究經歷

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圖像處理與網路工程實驗室, 上海交通大學	04/19–8/19
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指導教授: [翟廣濤](#)

專案名稱: [阿茲海默症病人走迷宮](#)

- 讓阿茲海默症患者走隨機生成的迷宮, 收集路徑相關的資料
- 訓練強化學習模型來模仿阿茲海默症病人走迷宮, 再用模型去測試更多隨機生成的迷宮
- 研究哪些種類的迷宮病人比較容易快速走出來, 不容易迷路
- 嘗試在新的建築架構中引入這些對病人友好的設計

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無線網路與人工智能實驗室, 上海交通大學密西根聯合學院	04/18–08/18
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指導教授: [王旭東](#)

- 對圖像資料使用圖像標準化, 旋轉, 裁減, 去噪等預處理方法
- 訓練不同的神經網路來做圖像分類與回歸的工作

## 工作經歷

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商湯科技, 上海	12/18–03/19
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人工智能研究實習生

導師: [李誠](#)

專案名稱: [用強化學習來計算有阻力電機最大水平拋球距離](#)

- 有兩個電機組成一個系統, 可以在擺盪後一段時間丟出球
- 用不同強化學習算法來計算有阻力電機最大水平拋球距離
- 可視化丟球的過程

- 讓使用者可以操控電機製造的力矩投球，並讓模型進行模仿學習
- 用強化學習得到一個難以解決問題的近似最優解

專案名稱: 人工智能導論教科書

- 協助開發高中人工智能相關的教材

## 助教經歷

微積分 I 助教	指導教授: Prof. Zachiri McKenzie	08/17–12/17
微積分 II 助教	指導教授: Prof. Zachiri McKenzie	02/18–05/18
微積分 III 助教	指導教授: Prof. Zachiri McKenzie	05/19–08/19
半導體材料與器件助教	指導教授: Prof. 但亞平	05/20–現今

## 學校專案

密碼學導論 05/19–08/19

- 實做 16 位 AES 跟 RC4 算法的加密與解密
- 研究 unicity distance and Shannon's theory of cryptography.
- 研究 the multiple polynomial quadratic sieves.

進階資料結構 08/18–12/18

- 實做二叉搜索樹與 KD 樹
- 用 Trie 來實現字串自動完成器與使用馬可夫方法來製作文件生成器
- 使用 decomposition of k-cores 算法來探討用戶在圖之間的關係

計算機視覺導論 08/18–12/18

- 實做 2D 傅立葉變換, Harris corner detector, 和不同的 feature descriptors.
- 實做 3D reconstruction by an eight-point algorithm, metric reconstruction function.
- 實做 iterative KLT tracker 來追蹤在影片中的物體.
- 使用不同神經網路來做圖像識別，並用各種技巧提升準確度

Single-cycle and pipelined CPU's 實作與模擬 05/19-08/19

- 使用 Verilog 來開發 single-cycle / pipelined CPUs with forward and hazard detection.

## 技能

程式語言: C (進階), C++ (進階), Python (進階), MATLAB(普通), Verilog (普通), Java (普通)

深度學習框架: Tensorflow (普通), Kera (進階), Pytorch (進階), Caffe (普通)

工具: LaTeX (進階), Git (普通), Shell (進階), Django (新手)

注：技能分成從低到高四個等級(新手, 普通, 進階, 專家)