Shiquan Zhang

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EDUCATION

University of Melbourne — Melbourne, Australia
Incoming Ph.D. Candidate in Human-Computer Interaction — Visa Pending Over 7 Months
Research Proposal: AI-Supported Collaborative Decision-Making in Smart Environments

University of Chinese Academy of Sciences (UCAS) — Beijing, China
Shenzhen Institute of Advanced Technology (**SIAT**) — Shenzhen, China
M.Eng. in Computer Technology GPA: 3.78/4 Ranking: 3/62 (5%) — Jun. 2019 – Jun.2022
Master Thesis: Artificial Intelligence Diagnosis Analysis of Cardiac Patent Foramen Ovale (Chinese)
Related Courses: Design and Analysis of Algorithms, Digital Image Processing, Digital Signal Processing, Data Visualization, Computer Architecture Cloud Computing and Big Data Processing, High-Performance Computing and Applications, 5G Wireless Communication, Biomedical Informatics

Hainan University (HNU) — Haikou, China
B.Eng. in Mechanical Engineering GPA: 3.27/4 Ranking: 20/111 (18%) — Sep. 2015 – Jun. 2019
Undergraduate Thesis: Vehicle License Plate Recognition System Based on OpenCV #Video Demo
Related Courses: C language program Design and Experiment, Control Engineering, Single Chip Microcomputer, Higher Mathematics, Linear Algebra Probability and Statistics, Data Structure, Principles of Computer Organization, Computer Network, Computer Operating System

SELECTED AWARDS

Human-Computer Interaction Ph.D. Offer at the University of Melbourne (Australia) and Melbourne Research Scholarship 2022
Computer Science Ph.D. Offer at the University of Sydney (Australia) and UniSydney-China Scholarship Council Joint Scholarship 2022
First place in the professional interview of SIAT in the Chinese Postgraduate Entrance Examination 2019
National Endeavor Scholarship 2017
HNU Outstanding Graduate 2019
HNU Elite Youth Training Program (1%) Mar. 2017 – Jun. 2019
HNU Merit student and Outstanding student leader 2016, 2017
First and Second prizes in the Innovation and Entrepreneurship Competition of the College of Mechanical and Electrical Engineering of HNU 2017
HNU Second-Class Scholarship 2016
First place in the Chemistry Competition of Guangdong Province of China 2014

Outstanding Volunteer of Public Science Day of the Chinese Academy of Sciences 2021
Outstanding Vice President of PKU Boxing Club of Peking University (PKU) Shenzhen 2019 – 2020
National Top 100 Summer Social Practice Team and Outstanding Individual 2018
Outstanding Volunteer of Haikou International Marathon Competition 2017
First place in the 1km Competition (Time: 3'03) in High School 2014

PUBLICATIONS

[1] Yang, J.#, **Zhang, S**.#, et al. A Machine Learning Approach Based on Spatio-Temporal Informations in the Detection of Patent Foramen Ovale from Contrast Transthoracic Echocardiography Images: A Primary Study. *Biomedical Signal Processing and Control* (co-first author paper, and accepted on 2023.03.10)

[2] Yin, L., Du, L., Li, Y., Xiao, Y., **Zhang, S.**, Ma, H., & He, W. (2021). Quantitative Evaluation of Gastrocnemius Medialis Stiffness During Passive Stretching Using Shear Wave Elastography in Patients with Parkinson's Disease: A Prospective Preliminary Study. *Korean Journal of Radiology, 22.* Nov;22(11):1841-1849 #https://doi.org/10.3348/kjr.2020.1338

[3] Yang, J., Zhang, H., Wang, Y., **Zhang, S.**, Lan, T., Zhang, M., ... & Du, L. (2020). The Efficacy of Contrast Transthoracic Echocardiography and Contrast Transcranial Doppler for the Detection of Patent Foramen Ovale Related to Cryptogenic Stroke. *BioMed research international, 2020*. Volume 2020, Article ID 1513409 #https://doi.org/10.1155/2020/1513409

PATENTS

[1] **Zhang, S.**, Xiao, Y., Du L., Ma T., Zheng, H. Patent foramen ovale detection method, system, terminal and storage medium, CN Invention and PCT, CN202011373095.3 & PCT/CN2020/139680, Both Granted.
[2] Xiao, Y., Zhang, X., **Zhang, S.**, Wang, C., Ma T., Zheng, H. Muscle ultrasonic image detection method, system, terminal, and storage medium, CN Invention and PCT, CN202011230395.6 & PCT/CN2020/139413, First trial.
[3] Tang, Z., Zhang, J., **Zhang, S.**, et al. A new mechanical impact buffering device for automobile, CN Utility Model, ZL201721292832.0, Granted.

RESEARCH EXPERIENCES

- **1 Removal of Domain Distribution's Differences in Radiomics Features**, Independent July. 2021 – Oct. 2022
  SIAT-Medical AI Center, advisor: P.I. Zhicheng Li
  # Feature Extraction, Empirical Bayes, Radiomics, CNNs
  - Discrepancy across domain distributions (e.g., multicenter/scanner model/reconstruction settings) may greatly influence radiomic feature extraction and cause degradation in subsequent data analysis. We have conducted experiments using deep learning methods to fit mathematical relationships to improve the performance of the traditional Combat (Empirical Bayes) algorithm in the feature domain.
- **2 Patent Foramen Ovale (Heart) Disease Classification**, Independent #Video #Slide Sep. 2019 – May. 2021
  SIAT-Paul C. Lauterbur Biomedical Imaging Lab & Shenzhen University & Beijing Tiantan Hospital, advisor: P.I. Yang Xiao and Prof. Yongjin Zhou
  # CNNs, Image Processing, Segmentation, Bubble Detection, Superpixel, Radiomics, Classification, Temporal Sequences, Echocardiography
  - Preliminarily achieved an automatic diagnosis method in patent foramen ovale (PFO) classification in 2D contrast echocardiography videos, which first explored the feasibility of PFO diagnosis with artificial intelligence, revolved around interference and microbubble detection, and achieved 0.7750 accuracies, 0.7847 sensitivity, and 0.7500 specificities compared to regular clinicians' 0.6800, 0.6200, and 0.8200.
  - Utilized CNNs (Deeplabv3+/Unet) to make 2D left atrium segmentation.
  - Proposed a time-domain preprocessing method to remove inherent interference (noise and motion artifacts) in echocardiography, which utilized conventional TTE imaging's prior knowledge and projected minimal gray intervals from TTE videos to cTTE videos, thereby minimizing inherent interference as much as possible.
  - Developed a two-stage detection method in the space domain, which includes a superpixel segmentation method and a radiomics method coarsely aggregates the features of similar pixels into superpixel block and discriminate bubbles under the constraints of grayscale threshold and elliptic or circular circularity further finely makes radiomics feature extraction and selection.
- **3 Muscle Atrophy Disease Classification**, Participate Sep. 2020 – Apr. 2021
  SIAT-Paul C. Lauterbur Biomedical Imaging Lab, advisor: P.I. Yang Xiao
  # CNN, Data Fusion, Classification, Elastography
  - Utilized 3D-ResNet to make a binary classification in 2D shear-wave elastography videos, which fused B-mode and SWE (shear wave elasticity) images realized the effective discrimination of muscle atrophy and achieved 0.9556 accuracies, 0.9557 sensitivity, and 0.9554 specificities.
- **4 Other Projects Experiences**

4.1 Competition

- **Shenzhen Cloud Cup Precipitation Nowcasting** May. - Jun. 2020
  # GAN, Temporal Sequences, Precipitation Prediction
  Enhanced the performance of ConvGRU by introducing the GAN module to make predictions of future precipitation in radar data.
- **User Cellphone Traffic Upgrade Prediction** Oct. - Nov. 2019
  # Machine Learning, Data Cleaning, Feature Engineering, SVM
  Preprocessed and analyzed text data, practiced feature engineering, and utilized basic machine learning models to make traffic upgrade classification.

4.2 Undergraduate projects

- **Sliding Double-deck Parking Space** #Video 2017. Sep - Jan. 2018
  # Mechanical Transmission, Physical Production, Design, and Rendering in Pro/E
  Designed a sliding mechanical transmission control system in a car parking area, which can semi-automatically park, lift and rotate, and participated in physical production, testing, and calibration.
- **Vehicle Life Monitoring System** #Video Jul. - Oct. 2017
  # Microcontroller, Sensors, GSM/GPS, Solar Power
  Designed a multi-judgment integrated system with an alarming mechanism to reflect the status of life forms, which covered positioning, sensor detection, solar battery, and false alarm release modules.

INTERNSHIP EXPERIENCES (FULL-TIME)

- **1 Artificial Intelligence Generated-Content (AIGC)-ChatGPT**, Product Manager & Algorithm — Shenzhen, China
  DeepWisdom, Mentor: Sirui Hong — Mar. 2023 – Apr.2023
  # **GPT-X, RLHF, Prompt Engineering, Nano-Model Training and Optimization, Market Research, Law Scenario Exploration**
  - Conducted competitive and market research for ChatGPT products (e.g., OpenAI/Microsoft/Baidu/Chinese Top Startups)
  - Deployed and optimizing large language models/API with leading Natural Language Processing methods (e.g., GPT-X/Whisper/ NanoGPT/GPT-Index/LLaMA/VisualChatGPT)
  - Shared a talk covering the background, history, technology, and future product implementation of ChatGPT within the company for over an hour
- **2 AIGC-AI Art Generation (AAG)+AutoML**, Product Manager & Algorithm #MetaAIGC-2D Character Generation — Shenzhen, China
  DeepWisdom, Mentor: Chenyu Ran, Sirui Hong — Dec. 2022 – Apr.2023
  # **Stable Diffusion, Game/Anime, PRD, MVP-Product Design, Model Training and Optimization, Interface Design**
  - Conducted competitive and market research for AAG products (NovelAI/Midjourney/ERNIE-ViLG/Scenario)
  - Deployed and optimizing large vision models with leading Computer Vision methods (e.g., Stable Diffusion/Dreambooth/ LoRA/ControlNet/CLIPVG)
  - Participated in the requirement analysis (Batch Production and Deployment of AAG models on the AutoML Platform), prototype design (PRD and Figma), and development coordination of the company's AAG+AutoML product.
  - ToCustomer: Launched a free demo product, exploring business monetization patterns, achieving over 500, 000 algorithm calls and operating about 1000 users' community
  - ToBusiness: Collaborating with a game production company to explore using AAG technology to synthesize icons of game scenes
- **3 Automated Machine Learning (AutoML) Platform**, Product Manager — Shenzhen, China
  DeepWisdom, Mentor: Chenyu Ran — Nov. 2022 – Feb. 2023
  # **AutoML, Middle Platform, Product Requirements Document (PRD), Market Research, Interface Design**
  - Conducted competitive and market research for relevant products.
  - Participated in the requirement analysis (Minimum dataset for CV/NLP/Multimodality tasks, Web Integrated Development Environment, Image Preprocessing Operator, and Model Evaluation Index and Visualization), prototype design (PRD and Figma), and development coordination of the company's Auto-Deep Learning Product.
  - Collaborated with the Software Development team to promote fast iteration of core AutoML platform product.

ONLINE LEARNING EXPERIENCES

- Doing **Natural Language Processing with Deep Learning** (CS224N), Stanford University**,** 2023 Spring
- Doing **Introduction for 15.S12 Blockchain and Money,** MIT, 2018 Fall
- **CS50-Introduction to Computer Science**, Harvard University, 2022 Spring #Learning Notes
- **The Missing Semester of Your CS Education**, MIT, 2020 Spring #Learning Notes
- **Design Novel Interaction** (INFO90003), The University of Melbourne, 2021 Fall #Learning Notes
- **Statistical Data Analysis** (R), Johns Hopkins University & Coursera, 2013 Fall #Code and Certificate on GitHub
- **Convolutional Neural Networks for Visual Recognition** (CS231n), Stanford University, 2019 Fall #Code on GitHub

SKILLS

1 Standardized Test: IELTS 6.5 (R7 L7 S6 W6) in Sep. 2021

2 Software:

•2.1 Programming
- •Proficient in Python/Matlab/R/C, GPT-X and GitHub Copilot
- •Linux/PyTorch/TensorFlow
- •Experiences with JavaScript/HTML/C++/SQL/LaTex

•2.2 Design
- **Mechanical Design**: Proficient in AutoCAD, Pro/E, and Single Chip Microcomputer
- **Graphic Design**: Proficient in Adobe Photoshop, Adobe Illustrator, and Figma
- **Video Design**: Proficient in Adobe Premiere and Adobe AfterEffects

3 Website: #sqzhang-jeremy.github.io

4 Multimedia: Amateur Image Designer/Video Editor/Movie Director #Portfolios

5 Hobby: Reading/Running/Badminton/Cooking/Classical & Jazz Music, and future Self-Media Blogger

6 Top Gameplayer on ChatGPT: Thoughts and Understanding of ChatGPT

7 Extra Curriculum: #More details (feel free to check)

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