Shiquan Zhang

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PERSONAL STATEMENT

I am a self-discipline and self-learning student and I love to try something new. I was engaged in the research of computer vision, machine learning and medical imaging. I am passionate about the application of artificial intelligence in biomedical field and dedicated to make contributions in healthcare.

EDUCATION

University of Chinese Academy of Science (UCAS) — Beijing, China
Shenzhen Institute of Advanced Technology (**SIAT**) — Shenzhen, China
M.Eng. in Computer Technology GPA: 3.78/4.0 — Jun. 2019 – Jun.2022
The first place in professional interview in Postgraduate Entrance Examination — 2019

Hainan University (HNU) — Haikou, China
B.Eng. in Mechatronic Engineering GPA: 3.27/4.0 Ranking: 20/111 — Sep. 2015 – Jun. 2019
HNU Outstanding Graduate — 2019
HNU Elite Youth Training Program (3%) — Mar. 2017 – Jun. 2019

RESEARCH EXPERIENCES

- **Domain Distributions' Removal in Radiomic Features**, Independent — May. 2021 – Present
SIAT-Medical AI Center, advisor: P.I. Zhicheng Li
  - Discrepancy across domain distributions (e.g., multicenter, scanner model, reconstruction settings) may greatly influence radiomic features extraction and cause degradation in the analysis performance. We have carried out some experiments trying to improve the Combat algorithm in feature domain.

- **Patent Foramen Ovale Disease Classification**, Independent — Sep. 2019 – Apr. 2021
SIAT-Paul C. Lauterbur Biomedical Imaging Lab & Shenzhen University & Peking Tiantan Hospital, advisor: P.I. Yang Xiao and Prof. Yongjin Zhou
  - Preliminarily achieved an automated diagnosis method in patent foramen ovale (PFO) classification in 2D contrast echocardiography videos, which firstly explored the feasibility of PFO diagnosis with artificial intelligence, revolved around interference and microbubble detection, and achieved 0.7750 accuracy, 0.7847 sensitivity and 0.7500 specificity 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 artefacts) in echocardiography, which utilized conventional TTE imaging's prior knowledge and projected minimal gray interval from TTE videos to cTTE videos, thereby minimizing inherent interference as much as possible.
  - Developed a two-stage detection method, a superpixel segmentation method and a radiomics method, in space-domain, which coarsely aggregates the features of similar pixels into superpixel block and discriminate bubbles under the constraints of grayscale threshold and elliptic or circular circularity, and further finely makes radiomics feature extraction and selection.

- **Muscle Atrophy Disease Classification**, Participate — Sep. 2020 – Apr. 2021
SIAT-Paul C. Lauterbur Biomedical Imaging Lab, advisor: P.I. Yang Xiao
  - Utilized 3D-ResNet to make 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 accuracy, 0.9557 sensitivity and 0.9554 specificity.

- **Other Projects Experiences**
  - Huawei Cloud Cup Precipitation Nowcasting — May. - Jun. 2020
    Enhanced the performance of convGRU through introducing GAN module to make prediction of future precipitation in radar data.
  - User Cellphone Traffic Upgrade Prediction — Oct. - Nov. 2019
    Preprocessed and analyzed text data, practiced feature engineering, utilized basic machine learning models to make traffic upgrade classification.
  - Quantitative Analysis of Contrast-Enhanced Ultrasound of Osteonecrosis of Femoral Head — Jun. - Aug. 2019
    Preprocessed ultrasound videos, utilized VGG16 to make segmentation and extracted features of ROIs to plot Time-Intensity Curve to analyze curve parameters.
  - Sliding Double-deck Parking Space — 2017. Sep - Jan. 2018

Designed a sliding mechanical transmission control system in car parking area, which can semi-automatically park, lift and rotate, and participated in the physical production, test and calibration. #Video link
- Vehicle Life Monitoring System   Jul. - Oct. 2017
Designed a multi-judgment integrated system with alarming mechanism to reflect the status of life form, which covered positioning, sensor detection, solar battery and false alarm release modules.

PUBLICATIONS AND PATENTS

[1] Yang, J., Zhang, H., Wang, Y., **Zhang, S.**, et al. 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. #https://doi.org/10.1155/2020/1513409

[2] Yin, L., Du, L., Li, Y., Xiao, Y., **Zhang, S.**, et al. 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, 2021. #https://doi.org/10.3348/kjr.2020.1338

[3] Zhang, X., Xiao, Y., Wang, C., **Zhang, S.**, et al. Deep residual convolutional neural network for the diagnosis of muscle atrophy based on dynamic ultrasound shear-wave elastography video. Chinese Journal of Biomedical Engineering, 2021. (minor revision)

[4] A coauthor clinical paper (writing)

[5] **Zhang, S.**, et al. Method and system for diagnosing patent foramen oval, CN Invention and PCT, CN202011373095.3& PCT/CN2020/139680, First trial.

[6] Zhang, X., Xiao, Y., **Zhang, S.**, et al. Deep residual convolutional neural network for the diagnosis of muscle atrophy based on dynamic ultrasound shear-wave elastography video, CN Invention and PCT, CN202011230395.6 & PCT/CN2020/139413, First trial.

[7] Tang, Z., Zhang, J., **Zhang, S.**, et al. A new mechanical impact buffering device for automobile, CN Utility Model, ZL201721292832.0, Issued.

Selected Awards

National inspirational scholarship	2017
HNU merit student and excellent student leader	2016, 2017
HNU second-class scholarship	2016
Chinese Academy of Sciences Public Science Day's outstanding volunteer	2021
National top 100 summer social practice team and outstanding individual	2018
Haikou International Marathon Competition's outstanding volunteer	2017

LEARNING EXPERIENCES

- **Convolutional Neural Networks for Visual Recognition** (CS231n), Standford University, Online #Code on github
- **Statistical Data Analysis**, Johns Hopkins University, Coursera #Code and certificate on github
- **Artificial Intelligence in Healthcare** (CS271), Standford University, Online

SKILLS

Standardized tests: IELTS 6 (R6.5 L6.5 S5.5 W6) in Jul. 2021
Programming skills:
    Proficient in Python, R, Matlab and C
    Experiences with LaTex, Javascript and HTML
    Technical Linux, Pytorch, Tensorflow and Keras
Software skills:
    Proficient in AutoCAD, Pro/E, Adobe Photoshop, Premiere, Illustrator and AfterEffects
Language: Chinese (native), English
Extracurriculum: #More details

Last Updated: 210909.