JIAYU HUO

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EDUCATION

Shanghai Jiao Tong University **Shanghai, China**

M.Eng. in Biomedical Engineering *Sep. 2018 - Mar. 2021 (expected)*

- **Research Topic:** Medical Image Analysis, Machine Learning, Semi-supervised Learning.
- **GPA:** 3.76/4.0
- **Relevant Coursework:** Computer Vision, Neural Network Theory and Applications, Probability Theory & Statistics.

Northeastern University (CN) **Shenyang, Liaoning, China**

B.Eng. in Biomedical Engineering *Sep. 2015 – Jun. 2018*

- **GPA:** 88.48/100
- **Relevant Coursework:** Linear Algebra, C/C++ Programming, Data Structure, Digital Image Processing, Digital Signal Processing.
- **Undergraduate Thesis:** Application of deep learning in ECG signal analysis, rated as **College Excellent Undergraduate Thesis.**

RESEARCH EXPERIENCE

Covid-19 Patients Diagnosis

Research Intern, at Shanghai United Imaging Intelligence *Feb. 2020 – May. 2020*

- Responsible for CT scans affine registration, model design, and result analysis.
- Proposed an attention-based model which can differentiate COVID-19 from community acquired pneumonia.

Semi-supervised Knee Cartilage Defects Assessment

Research Intern, at Shanghai United Imaging Intelligence *Nov. 2019 – Sep. 2020*

- Proposed a dual-consistency self-ensembling framework for the semi-supervised knee cartilage defects assessment task. The proposed framework is based on mean teacher model and aims to penalize the inconsistency of output classification probability and attention masks. The dataset only consists of T2-weighted MR images, and the defect level is based on the whole-organ magnetic resonance imaging score (WORMS).

Kaggle RSNA Intracranial Hemorrhage Detection Challenge

Research Intern, at Shanghai United Imaging Intelligence *Oct. 2019 – Nov. 2019*

- Responsible for CT scans preprocessing, model design, and results ensemble, **awarded silver medal (top 4%).**

Consciousness-Related Brain Regions Segmentation for Traumatic Brain Injury Patients

Graduate Researcher, at Medical Image Computing Lab, SJTU *May. 2019 – Oct. 2019*

- Developed a two-stage segmentation framework. In the first stage, multi-atlas-based segmentation (MABS) is used to generate the coarse brain region segmentation masks. In the second stage, the coarse segmentation masks and the raw T1-weighted MR images were concatenated together and fed into the attention U-Net to obtain the final segmentation results.

Consciousness Evaluation of Hydrocephalus Patients Before and After Lumbar Drainage

Graduate Researcher, at Medical Image Computing Lab, SJTU *Sep. 2018 – May. 2019*

- Proposed a joint feature selection and regression model to regress the JFK Coma Recovery Scale-Revised (CRS-R) scores, so that the level of patients' consciousness can be quantified.

Application of Deep Learning in ECG Signal Analysis
Undergraduate Researcher, at Machine Recognition Lab, NEU *May. 2017 – Jun. 2018*

- Proposed an ECG signal classification algorithm based on 1D convolution neural network and recurrent neural network. The proposed algorithm was tested on CINC 2017 challenge dataset to demonstrate its robustness.

PRESENTATIONS & PUBLICATIONS

- **A Self-ensembling Framework for Semi-supervised Knee Cartilage Defects Assessment with Dual-Consistency**
  Jiayu Huo, Liping Si, Xi Ouyang, Kai Xuan, Weiwu Yao, Zhong Xue, Qian Wang, Dinggang Shen, Lichi Zhang.
  MICCAI Workshop on PRedictive Intelligence in MEdicine, **Oral Presentation**, *October* 2020.
- **Neuroimage-Based Consciousness Evaluation of Patients with Secondary Doubtful Hydrocephalus Before and After Lumbar Drainage**
  Jiayu Huo#, Zengxin Qi#, Sen Chen, Qian Wang, Xuehai Wu, Di Zang, Tanikawa Hiromi, Jiaxing Tan, Lichi Zhang, Weijun Tang, Dinggang Shen.
  Neuroscience Bulletin, *July 2020*.
- **Dual-Sampling Attention Network for Diagnosis of COVID-19 from Community Acquired Pneumonia**
  Xi Ouyang#, **Jiayu Huo**#, Liming Xia, Fei Shan, Jun Liu, Zhanhao Mo, Fuhua Yan, Zhongxiang Ding, Qi Yang, Bin Song, Feng Shi, Huan Yuan, Ying Wei, Xiaohuan Cao, Yaozong Gao, Dijia Wu, Qian Wang, Dinggang Shen.
  IEEE Transactions on Medical Imaging, May 2020.
- **Robust Brain Magnetic Resonance Image Segmentation for Hydrocephalus Patients: Hard and Soft Attention**
  Xuhua Ren#, **Jiayu Huo**#, Kai Xuan, Dongming Wei, Lichi Zhang, Qian Wang.
  IEEE 17th International Symposium on Biomedical Imaging (ISBI), *April 2020*.
- **Thermodynamic edge entropy in Alzheimer's disease**
  Jianjia Wang, **Jiayu Huo**, Lichi Zhang.
  Pattern Recognition Letters, July 2019.
- **SLIR: Synthesis, localization, inpainting, and registration for image-guided thermal ablation of liver tumors**
  Dongming Wei, Sahar Ahmad, **Jiayu Huo**, Pu Huang, Pew-Thian Yap, Zhong Xue, Jianqi Sun, Wentao Li, Dinggang Shen, Qian Wang.
  Medical Image Analysis, October 2020.
- **Learning Hierarchical Attention for Weakly-supervised Chest X-Ray Abnormality Localization and Diagnosis**
  Xi Ouyang, Srikrishna Karanam, Ziyan Wu, Terrence Chen, **Jiayu Huo**, Xiang Sean Zhou, Qian Wang, Jie-Zhi Cheng.
  IEEE Transactions on Medical Imaging, Dec 2020.

TEACHING ASSISTANT EXPERIENCE

- Artificial Intelligence and Medical Engineering *2020 Fall*
- Computer Vision in Biomedical Engineering *2020 Spring*
- Data Structure *2019 Spring*

HONORS & AWARDS

- National Scholarship for Graduate Students. *Sep. 2020*
- 2nd Prize, SJTU Graduate Student Academic Forum. *Jul. 2019*
- Bronze Award, International Genetically Engineered Machine Competition (iGEM). *Jul. 2017*
- Meritorious Winner, MCM/ICM. *Apr. 2017*

SKILLS

- **Coding:** Python (PyTorch, Tensorflow), C/C++, MATLAB, OpenCV, Git.
- **English Language Proficiency:** IELTS (6.5), TOEFL (90).