

# WENQI SHI

313 Ferst Dr NW, Atlanta, GA 30332 • (404) 386-6010 • [wshi83@gatech.edu](mailto:wshi83@gatech.edu)

## EDUCATION

---

### Georgia Institute of Technology

Ph.D. candidate, Department of Electrical and Computer Engineering

Research Topic: *precision medicine, clinical decision support, data-centric AI, responsible AI*

Thesis: *Advancing Personalized Medicine through Responsible Artificial Intelligence*

Advisor: *Dr. May D. Wang*

Atlanta, GA

Aug 2019 – May 2024

### Beijing Normal University

B.S., Department of Electric Information Science and Technology

Research Topic: *computer vision, deep learning, saliency analysis, remote sensing*

Advisor: *Dr. Libao Zhang*

Beijing, China

Sept 2015- July 2019

## SELECTED PUBLICATIONS

---

(The full publication list can be found in [this link](#), \* stands for equal contribution:)

1. **Wenqi Shi\***, Jimin Sun\*, et al. "Improving explainable AI with patch perturbation-based evaluation pipeline: a COVID-19 X-ray image analysis case study." *Scientific Reports* 13, no. 1 (2023): 19488. (IF=4.9)
2. **Wenqi Shi\***, Felipe Giuste\*, et al. "Explainable artificial intelligence methods in combating pandemics: A systematic review." *IEEE Reviews in Biomedical Engineering* (2022). (IF=17.6) **(Annual Featured Article)**
3. **Wenqi Shi**, et al. "COVID-19 automatic diagnosis with radiographic imaging: Explainable attention transfer deep neural networks." *IEEE Journal of Biomedical and Health Informatics* 25.7 (2021): 2376-2387. (IF=7.7)
4. Tong, Li, **Wenqi Shi**, et al. "Integrating Multi-omics Data with EHR for Precision Medicine Using Advanced Artificial Intelligence." *IEEE Reviews in Biomedical Engineering* (2023). (IF=17.6)
5. Felipe Giuste, Lawrence He, Peter Lais, **Wenqi Shi**, et al. "Early and fair COVID-19 outcome risk assessment using robust feature selection." *Scientific Reports* 13.1 (2023): 18981. (IF=4.9)
6. Felipe Giuste, ... & **Wenqi Shi**, et al. "Explainable synthetic image generation to improve risk assessment of rare pediatric heart transplant rejection." *Journal of Biomedical Informatics* 139 (2023): 104303. (IF=4.5)
7. Sofiya Vyshnya, Rachel Epperson, Felipe Giuste, **Wenqi Shi**, et al. "Optimized Clinical Feature Analysis for Improved Cardiovascular Disease Risk Screening." *IEEE Open Journal of Engineering in Medicine and Biology (OJEMB)*, 2023. (IF=5.8)
8. **Wenqi Shi**, et al. "Retrieval-Augmented Large Language Models for Adolescent Idiopathic Scoliosis Patients in Shared Decision-Making." *Proceedings of the 14th ACM International Conference on Bioinformatics, Computational Biology, and Health Informatics*. 2023. **(Best SIGBio Paper Award, 1/91, Large Language Models for Healthcare)**
9. **Wenqi Shi**, et al. "Choice Over Effort: Mapping and Diagnosing Augmented Whole Slide Image Datasets with Training Dynamics." *Proceedings of the 14th ACM International Conference on Bioinformatics, Computational Biology, and Health Informatics*. 2023.
10. **Wenqi Shi\***, Mio Murakoso\*, Grace Guo\*, et al. "Development of Interpretable Machine Learning Models for COVID-19 Drug Target Docking Scores Prediction." *2023 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*. IEEE, 2023.
11. **Wenqi Shi\***, Mio Murakoso\*, Grace Guo\*, et al. "Effective Surrogate Models for Docking Scores Prediction of Candidate Drug Molecules on SARS-CoV-2 Protein Targets." *2023 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*. IEEE, 2023.
12. **Wenqi Shi**, et al. "Mapping and Diagnosing Augmented Whole Slide Image Datasets with Training Dynamics." *Deep Generative Models for Health Workshop NeurIPS 2023*. 2023.

13. **Wenqi Shi\***, Felipe Giuste\*, et al. "A FHIR-compliant application for multi-site and multi-modality pediatric scoliosis patient rehabilitation." *2021 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*. IEEE, 2021.
14. **Wenqi Shi**, et al. "Learning from heterogeneous data via contrastive learning: An application in multi-source covid-19 radiography." *2021 IEEE EMBS International Conference on Biomedical and Health Informatics (BHI)*. IEEE, 2021.
15. **Wenqi Shi**, et al. "Exam: an explainable attention-based model for covid-19 automatic diagnosis." *Proceedings of the 11th ACM international conference on bioinformatics, computational biology and health informatics*. 2020.
16. Zhong, Yishan, Benoit Marteau, Andrew Hornback, Yuanda Zhu, **Wenqi Shi**, et al. "IDTVR: A Novel Cloud Framework for an Interactive Digital Twin in Virtual Reality." *In 2022 IEEE 2nd International Conference on Intelligent Reality (ICIR)*, pp. 21-26. IEEE, 2022. **(Best Paper Award)**
17. Giuste, Felipe O., Lawrence L. He, Monica Isgut, **Wenqi Shi**, et al. "Automated risk assessment of covid-19 patients at diagnosis using electronic healthcare records." *In 2021 IEEE EMBS International Conference on Biomedical and Health Informatics (BHI)*, pp. 1-4. IEEE, 2021. **(Best Poster Award in IEEE Healthcare Summit)**

## PREPRINTS & SUBMISSIONS

---

1. **Wenqi Shi**, et al. "Development of Predictive Models for Patient Rehabilitation Outcomes After Spinal Deformity Surgery: Towards Personalized Medicine." in submission to *Lancet eClinicalMedicine*, under review, 2023. (IF=15.1)
2. Wu, Hang\*, **Wenqi Shi\***, and May D. Wang. "Developing a novel causal inference algorithm for personalized biomedical causal graph learning using meta machine learning", in submission to *IEEE Journal of Biomedical and Health Informatics*, under major revision, 2023. (IF=7.02)
3. Hang Wu\*, **Wenqi Shi\***, et al. " Clinical Decision Making under Uncertainty: A Bootstrapped Counterfactual Inference Approach", in submission to *BMC Medical Informatics and Decision Making*, under review, 2023.
4. Xu, Ran, Hejie Cui, Yue Yu, Xuan Kan, **Wenqi Shi**, et al. "Knowledge-infused prompting: Assessing and advancing clinical text data generation with large language models." *arXiv preprint arXiv:2311.00287* (2023). **(Large Language Models for Healthcare)**

## RESEARCH EXPERIENCE

---

### Georgia Institute of Technology, Wallace H. Coulter Dept. of BME

Atlanta, GA

Graduate Research Assistant, Advisor: Dr. May D. Wang

Dec 2019 – Present

- **Large Language Models for Healthcare.** Developed large language model agents for healthcare applications to facilitate clinical research and practice for clinicians, as well as support shared decision-making process for patients and their families.
- **Data-Centric AI for Precision Medicine.** Advanced multi-site and multi-modal imperfect patient data integration and harmonization to improve the performance and robustness of AI models. This is achieved by generative AI, contrastive learning, multiple clinical data exchange standards with an ultimate goal of personalized and precision medicine.
- **Responsible AI Model for Clinical Decision Support.** Developed responsible machine learning algorithms for clinical decision support and applied explainable, trustworthy, generalized, and fair AI models to solve real-world problems in clinical research and practice.

### Beijing Normal University, School of Artificial Intelligence

Beijing, China

Undergraduate Research Assistant, Advisor: Dr. Libao Zhang

Aug 2016 – July 2019

- **Saliency-Guided Active Contour Model for Airport Detection.** Developed a saliency-guided active contour model for airport detection in remote sensing images. This model: a) utilizes sparse reconstruction to improve the robustness of saliency detection, and b) integrates gradient information into energy function, enhancing its discriminatory capabilities.

## The University of Hong Kong, Dept. of Electrical Engineering

Undergraduate Research Intern, Advisor: Dr. Yik-Chung Wu

Hong Kong

May 2018 – Aug 2018

- **Multi-Talker Speech Signal Processing and Emotion Detection.** Developed a multi-talker speech separation system to (1) separate voice of staffs from customers in the recordings of customer service calls and (2) identify emotion of customers using natural language processing.

## TEACHING EXPERIENCE

---

### Georgia Institute of Technology

Atlanta, GA

Head Teaching Assistant, Department of BME and ECE

Spring 2020 - Present

- Exercise Lesson Instructor and Head TA for *BMED6780/ECE6780/BMED4783/ECE4783 Medical Image Processing* in Spring 2021/Spring 2022/Spring 2023 Semesters.
- Exercise Lesson Instructor and Head TA for *BMED4813/BMED8813 Biomedical and Health Informatics* in Spring 2021/Summer 2021/Spring 2022/Summer 2022/Spring 2023/Summer 2023 Semesters.
- Head TA for *BMED 2400 Biostatistics* Fall 2021/Fall 2022 Semesters.

## INDUSTRY EXPERIENCE

---

### Google Research

Mountain View, California

Computer Science Research Mentorship Program, Mentor: Dr. Patrick Riley

Mar 2021 – May 2021

- Conducted research on molecular property prediction by embedding molecules into a continuous feature space. This facilitates various downstream tasks such as creating handcrafted molecule fingerprints, learning molecular sequence representations, and developing both supervised and self-supervised molecular graph representation learning models.

### XIAOMI AI

Beijing, China

Research Intern, Mentor: Dr. Jiefu Tan

Oct 2018 – Apr 2019

- Developed an AI-agent framework that enables the creation, update, and integration of shortcuts for single or multiple mobile applications through the Mi AI voice assistant. This framework operates based on user instructions, seamlessly integrating with AI speakers.

## SELECTED MENTORING EXPERIENCE

---

I have been fortunate and honored to mentor 3 high school, 11 undergraduate, and 12 graduate students at Bio-MIBLab since 2021. My mentees come from diverse disciplinary backgrounds including BME, CS, and ECE. Among them, 8 are female students and 15 are international students. The following list includes students working with me on thesis work or multi-semester projects:

Vyshnya, Sofiya (Female), Undergrad in GT BME, MD/PhD in Case Western Reserve Univ., 2021-2022  
Co-authored paper: OJEMB 2023 (IF=5.80)

Sun, Jimin (Female), Undergrad in GT CS, MD/PhD in Seoul National Univ., 2021-2022  
Co-authored paper: Sci. Rep. 2023 (IF=4.99)

Murakoso, Mio (Female), Undergrad in Kyoto University, 2022-present  
Co-authored paper: BIBM 2022 (AC Rate=19%), BIBM 2023 (AC Rate=19%)

## INVITED TALKS & PRESENTATIONS

---

AMIA 2023 AI Evaluation Showcase Stage I, II, and III 2023  
EECS Rising Star Workshop 2023 2023  
ACM BCB 2023 Conference Women in Engineering Panel 2023

Workshop Medical Imaging meets NeurIPS	2023
Workshop Deep Generative Models for Health at NeurIPS 2023	2023

## HONORS & AWARDS

<b>Best SIGBio Paper Award in ACM BCB conference 2023</b>	<b>2023</b>
<b>EECS Rising Star Award 2023</b>	<b>2023</b>
1 <sup>st</sup> Place in Bioinformatics Data Hackathon of IEEE BHI 2023	2023
1 <sup>st</sup> Place in RNA sequence Data Hackathon of IEEE BHI 2023	2023
Honorable Mention in Sensor Data Hackathon of IEEE BHI 2023	2023
Finalist of the John H. Moe Award for Best Basic Science E-Poster at the SRS 57th Annual Meeting	2022
<b>IEEE Reviews in Biomedical Engineering Annual Featured Article</b>	<b>2022</b>
<b>Best Paper Award in IEEE ICIR conference 2022</b>	<b>2022</b>
<b>Best Poster Award (1st place) in 2021 IEEE Healthcare Summit</b>	<b>2021</b>
Top-10 Teams on 2021 AMIA/HL7 FHIR Applications Competition	2021
First-class Scholarship, Beijing Normal University	2016-2019
First Prize of Academic Competition in Beijing Normal University	2017,2018
Liyun Scholarship of Beijing Normal University	2016-2019
Honorable Mention in American Mathematical Contest in Modeling	2017
Second Prize of Chinese Mathematical Contest in Modeling, Beijing	2017

## GRANTS & FELLOWSHIPS

NSF Student Travel Grant for IEEE BHI (\$1,000)	2023
NSF Student Travel Grant for ACM BCB (\$800)	2022,2023
Georgia Tech Graduate Student SGA Conference Travel Grant (\$250)	2022,2023
Georgia Tech COE&COS Conference Travel Grant (\$250)	2022,2023
Nakatani Research & International Experience Mentorship Program (\$3,000)	2022

## ACADEMIC REVIEW SERVICE

IEEE Journal of Biomedical and Healthcare Informatics (IEEE JBHI, IF=7.7)	2020-Present
IEEE Transactions on Biomedical Engineering (IEEE TBME, IF=4.6)	2020-Present
IEEE Reviews in Biomedical Engineering (IEEE RBME, IF=17.6)	2020-Present
Nature Scientific Reports (IF=4.9)	2020-Present
AMIA Annual Symposium	2022,2023
IEEE COMPSAC	2020,2021,2022,2023
Journal of Medical Systems, Springer (IF=5.3)	2023
Signal, Image and Video Processing, Springer (IF=2.0)	2023
Multimedia Systems, Springer (IF=3.2)	2023
Heliyon, Cell (IF=4.0)	2022,2023
Alzheimer's Research & Therapy, Springer (IF=8.8)	2022
International Journal of Data Science and Analytics (IF=2.4)	2022

## LEADERSHIP & VOLUNTEER

Publicity Student Co-Chair for ACM SIGBio Community	2022-Present
Publicity Student Co-Chair for IEEE EMBS Community	2022-Present
Program Committee for Net-AI-BHI Workshop at BIBM 2023	2023
Student Volunteer for ACM BCB 2023 Conference	2023
Student Volunteer for IEEE BHI 2023 Conference	2023
Student Volunteer for NeurIPS 2023 Conference	2023
Guest editors for Frontiers Digital Medicine	2022
Publicity Co-Chair for 2021 IEEE Healthcare Summit	2021