Ziqi Xu

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Research Interests

Machine Learning (ML) and its applications. My current interest focuses on ML for health, leveraging wearable devices for health monitoring and developing trustworthy predictive models. My previous research covered treatment effects and Electronic Health Records (EHR)-based inference.

Education

Washington University in St.Louis   May 2027 (Expected)

Ph.D. in Computer Science
GPA: 4.0/4.0 — Research: Applied Machine Learning for Healthcare

Washington University in St.Louis   May 2022

B.S. with double major in Computer Science and Maths
GPA: 3.99/4.0 — Coursework: Machine Learning, Data Mining, Computer vision

Selected Publication

Wearable Devices for Health Monitoring

Predicting Multi-dimensional Surgical Outcomes with Multi-modal Mobile Sensing
Ziqi Xu, J. Zhang, J. Greenberg et al.   2024
Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (**IMWUT**) (Oral)

Incorporating Uncertainty in Predictive Models Using Mobile Sensing and Clinical Data
Ziqi Xu, J. Zhang, H. Simon, et al.   2024
Under review of Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (**IMWUT**)

Addressing Patient Variability with Adaptive Fusion of Wearable and Clinical Data
J. Zhang, R. Wang, **Ziqi Xu**, et al.   2024
Under review of Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (**IMWUT**)

Preoperative mobile health data improve predictions of recovery from lumbar spine surgery
J. Greenberg*, M. Frumklin*, **Ziqi Xu***(*equal contribution) et al.   2024
Neurosurgery

Multi-domain Postoperative Recovery Trajectories after Lumbar and Thoracolumbar Spine Surgery
S. Yakdan, J. Zhang, B. Benedict, **Ziqi Xu**, et al.   2024
Under review of **Journal of Neurosurgery**

EHR-based Clinical Inference

Assisting clinical decisions for scarcely available treatment via disentangled latent representation
B. Xue, A. Said, **Ziqi Xu**, et al.   2023
ACM SIGKDD Conference on Knowledge Discovery & Data Mining (**KDD**) (Oral)

Using Artificial Intelligence to Identify Three Presenting Phenotypes of Chiari Type-1 Malformation and Syringomyelia
V. Gupta*, **Ziqi Xu***(*equal contribution), J. Greenberg, et al.   2024
Neurosurgery

Utilizing Semantic Textual Similarity for Clinical Survey Data Feature Selection
B. Warner, **Ziqi Xu**, S. Haroutounian, et al.   2023
arxiv:2308.09892, in submission ACL Rolling Review (**ARR**)

Validation of extracorporeal membrane oxygenation mortality prediction and severity of illness scores in an international COVID-19 cohort
B. Xue, A. Said, **Ziqi Xu**, et al.   2023
Artificial Organs

Machine learning and lumbar spondylolisthesis

S. Yakdan, K. Botterbush, *Ziqi Xu*, et al.   2023
Seminars in Spine Surgery

Using machine learning to predict poor adherence to antiretroviral therapy among adolescents living with HIV in low resource settings
C. Najjuuko, *Ziqi Xu*, S. Kizito, et al.   2024
Under review of **Nature Communication**

Experience

Undergraduate Research, Washington University in St. Louis – St. Louis, MO   July 2021 – Aug 2022
- Worked closely with Prof. Chenyang Lu and Dr. Bing Xue on causal inference and treatment effects.
- Contributed to evaluation of TVAE model in real-word ISARIC dataset for COVID patients and synthetic datasets.

Software Engineer, ORKA Health Technology Co., Ltd – Shanghai, China   May 2021 – Jul 2021
- Implemented the main functionality of APP with 50+ real users with hearing problems with Flutter that allows registration, switching mode, adjusting volumes and built customized widgets to standardize style.
- Performed AB test and event tracking and analyzed user reports with SQL.

Software Engineer, IdeaBank Technology Co., Ltd – Wuxi, China   May 2020 – Aug 2020
- Deployed Ruoyi administration system on Linux system and worked on source code with team members.
- Implemented the chronograph, tab-sliding and lazy-load for items in the online WeChat mini-program.

Course Projects

Stochastic Quasi-Newton Methods   2023
- Investigated Stochastic Quasi-Newton (SQN) methods which ease iteration complexity using hessian approximation methods combined with stochastic approximations.
- Implemented and evaluated SGD, BFGS, RES in large-scale data optimization with performance and efficiency.

Open-world Object Detection on Smart Kitchen   2023
- Proposed and generated a hybrid dataset with both synthetic and real-world images, where the synthetic one help with data augmentation and generability of the model.
- Employ the light-weighted YOLO-v5 model and finetuned on our dataset, which achieves a great empirical performance with mean Average Precision (mAP) of 94.4%.

Automatic Generation of Handwritten Photo Descriptions   2023
- Built an end-to-end pipeline that integrates the image captioning model and the hand-written text generator.
- Conducted experiments of different architectures of Resnet with BLEU score and efficiency.

Teaching

Assisstant Instructor for *CSE 419A: Introduction to AI for Health*   Fall 2024
Assisstant Instructor for *CSE 531A: AI for Health*   Spring 2024
Teaching Assisstant for *CSE 240: Logic and Discrete Mathematics*   Spring 2020

Peer Review

Scientific Reports   2024
Signa Vitae   2024

Awards

Dean's Select Ph.D. Fellowship – Awarded as a Dean's Select Ph.D. Scholar   2022
Summa Cum Laude – Latin Honor cumulative WashU GPA   2022
Dean's List – Academic Honor from WashU School of Engineering   2020, 2021, 2022