Yu (Adam) Ding

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Objective

Ph.D. in Industrial and Systems Engineering focusing on statistical machine learning and deep learning for healthcare data analysis. My recent research includes designing machine learning models and foundation models for cancer genomics, as well as improving healthcare operations management and patient treatment planning.

Professional Experience

- **The University of Texas MD Anderson Cancer Center** *Sep 2024 - Present*
  Postdoc Research Fellow, Mentor: Dr. Wenyi Wang Houston, Texas
  - Develop statistical machine learning model using cancer genomics
- **The University of Kansas, School of Business** *May 2019 - Jul 2020*
  Research Assistant Lawrence, Kansas
  - Develop capacity management model and optimal investment planning by stochastic dynamic programming

Education

- **Ph.D. in Industrial and Systems Engineering at Binghamton University** *Aug 2020 - Aug 2024*
  Advisor: Dr. Bing Si Vestal, New York
- **M.S. in Industrial Engineering at Wayne State University** *Aug 2017 - Apr 2019*
  Advisor: Dr. Qingyu Yang Detroit, Michigan
- **B.S. in Geophysics at University of Science and Technology of China** *Aug 2013 - Jun 2017*
  Advisor: Dr. Wei Zhang Anhui, China

Research Topics

My previous research focuses on Statistical Machine Learning and Data Fusion with Applications to Healthcare Systems.

- **Precision Medicine and Privacy-Preserving** *2021 - 2023*
  Tools: [Functional Regression, Federated Learning, Python, R] [ ]
  - Develop statistical machine learning for obstructive sleep apnea telemedicine
  - Develop a gradient boosting algorithm to solve multivariate function-on-function regression problems efficiently
  - Develop horizontal and vertical Federated Learning (FL) frameworks to use data from different organizations collaboratively with privacy-preserving
- **Diagnosis and subtyping** *2020 - 2022*
  Tools: [Factor Mixture Model, Sequential Equation Model, Multi-modal data analysis, R]
  - Develop clustering algorithm for cardiometabolic patient phenotype discovery
  - Develop a unified framework for subgroup discovery from multi-modal mixed-type data
  - Use structural equation modeling to achieve structured sparsity from heterogeneous health data

Honors and Awards

- **QCRE Best Student Paper Competition Finalist** *May 2024*
  Institute of Industrial and Systems Engineers Annual Conference & Expo
- **National Science Foundation (NSF) Travel Awards** *May 2024*
  The University of Arizona
- **Watson Professional Development Fund** *Apr 2024*
  Binghamton University
- **Summer Research Fellowship** *Apr 2020*
  The University of Kansas
- **University Graduate Fellowship** *Aug 2019*
  The University of Kansas
- **Graduate Fellowship** *Aug 2018*
  Wayne State University
- **National Encouragement Scholarship** *Aug 2016*
  University of Science and Technology of China
- **Kansas Half Marathon Finisher Price** *Oct 2019*
  Kansas Half Marathon

PUBLICATIONS

M = MANUSCRIPT, J=JOURNAL, T=THESIS, *: CORRESPONDING AUTHOR

[M.4] **Ding, Y.**, Somers, V., Si, B.* (2024). **A novel sparse generalized structural equation modeling with structured sparsity for subgroup discovery from multi-modal mixed-type data**. Manuscript submitted for publication in *IISE Transactions*

[M.3] **Ding, Y.**, Costa, C., Si, B.* (2024). **Federated function-on-function regression with an efficient gradient boosting algorithm for privacy-preserving telemedicine**. Manuscript submitted for publication in *IISE Transactions*; **Selected as QCRE Best Student Paper Competition Finalist, IISE Montreal, 2024**

[M.2] Mueller, S.*, **Ding, Y.**, Si, B., Sutherland, M., Hutchinson, K. (2024). **Access to Campus Health Services at MSI and Non-MSI Colleges and Universities in the U.S.**. Manuscript submitted for publication in *Health Equity*

[M.1] **Ding, Y.**, Costa, C., Si, B.* (2024). **Vertical Federated Learning of Gradient Boosting for Functional Regression with Differential Privacy**. Manuscript submitted for publication in *IEEE Transactions on Privacy*

[T.1] **Ding, Y.** (2024). **Statistical Machine Learning and Data Fusion Methodologies: Applications in Healthcare**. *Binghamton University*.

[J.5] Sutherland, M. A.*, Hutchinson, M. K., Si, B., **Ding, Y.**, Liebermann, E., Connolly, S. L., … Mueller, S. D. (2024). **Health screenings in college health centers: Variations in practice**. *Journal of American College Health*, Vol. XX, Issue X, pp. 1-8. DOI: 10.1080/07448481.2024.2361307

[J.4] Mueller, S. D. *, Sutherland, M. A., Hutchinson, M. K., Si, B., **Ding, Y.**, Connolly, S. L. (2024). **Student Health Services at Historically Black Colleges and Universities and Predominantly Black Institutions in the United States**. *Health Equity*, Vol. 8, Issue 1, pp. 226-234. DOI: 10.1089/heq.2023.0219

[J.3] Alramadeen, W., **Ding, Y.**, Costa, C., Si, B. * (2023). **A novel sparse linear mixed model for multi-source mixed-frequency data fusion in telemedicine**. *IISE Transactions on Healthcare Systems Engineering*, Vol. 13, Issue 3, pp. 215-225. DOI: 10.1080/24725579.2023.2202877; **Selected as a Feature Article by the ISE Magazine**

[J.2] Jiang, L., **Ding, Y.**, Sutherland, M. A., Hutchinson, M. K., Zhang, C., Si, B. * (2022). **A novel sparse model-based algorithm to cluster categorical data for improved health screening and public health promotion**. *IISE Transactions on Healthcare Systems Engineering*, Vol. 12, Issue 2, pp. 137-149. DOI: 10.1080/24725579.2021.1980467

[J.1] **Ding, Y.**, Yang, Q.*, King, C. B., Hong, Y. (2019). **A general accelerated destructive degradation testing model for reliability analysis**. *IEEE Transactions on Reliability*, Vol. 68, Issue 4, pp. 1272-1282. DOI: 10.1109/TR.2018.2883983

CONFERENCE PRESENTATION AND INVITED TALKS

- **Federated function-on-function regression with an efficient gradient boosting algorithm for privacy-preserving telemedicine**, Department of Radiation Oncology, Mayo Clinic Arizona, July 1st, 2024
- **Federated function-on-function regression with an efficient gradient boosting algorithm for privacy-preserving telemedicine**, IISE Montreal, May 18th, 2024 [🌐]

TEACHING EXPERIENCE

- **Guest Lecturer at Binghamton University** *Spring 2024*
  develop course materials, give twelve lectures, host review sessions, and email Q&A
  - SSIE 548: Healthcare Data Sci & Analytics (graduate class)
  - ISE 448: Healthcare Data Sci & Analytics (undergraduate class)
  - Teaching Evaluation Score: 4.5/5.0
- **Teaching Assistant at Wayne State University** *Spring 2018*
  give lectures on selected topics and reviews, prepare exam questions and manage proctoring, and hold office hours and email Q&A
  - IE 6430 Computer Simulation Methods (graduate class)
- **Teaching Assistant at Wayne State University** *Fall 2017*
  give lectures on selected topics and reviews, prepare exam questions and manage proctoring, and hold office hours and email Q&A
  - IE 7270 Reliability Estimation (graduate class)

GRANT WRITING EXPERIENCE

- **Helped Ph.D. advisor Dr. Bing Si to prepare and conduct the following grants funded by NIH and industry**
  Binghamton University
  - NIH/NHLBI, "R01HL168173: Sleep and Cardiometabolic Subgroup Discovery and Risk Prediction in United States Adolescents and Young Adults". Amount: $2,452,065
  - NIH/NHLBI, "R21HL161765: Towards Precise Phenotype Discovery of Obstructive Sleep Apnea with a Data-Inclusive Multi-Study Analysis". Amount: $242,770
  - SUNY-IBM AI Research Alliance, "Ray-F2R-FL: Ray-based Functional Regression with Federated Learning". Amount: $200,000
- **Summer Research Fellowship**
  The University of Kansas
  - Independently wrote a proposal for a Student-Led Research Grant. Amount: $5,000

Professional Memberships

- **Institute of Industrial and Systems Engineers (IISE)**
- **Institute for Operations Research and the Management Sciences (INFORMS)**
- **Institute of Electrical and Electronics Engineers (IEEE)**

Professional Service

- **Journal reviewer of IEEE Transactions on Medical Imaging**
- **Journal reviewer of IISE Transactions on Healthcare Systems Engineering**
- **Lab Manager of Microstructure Manufacturing Lab, Wayne State University**
- **Seminar Organizer and Volunteer, Wayne State University**

Additional Information

Programming languages: Python, C/C++, R, Java, LaTeX
Tools and Frameworks: Tensorflow, Keras, Pytorch, Pandas, NetworkX, Git, Ray, Amazon AWS

References

1. **Reference Person 1**
   Job Title, Department
   Organization/Institution Name
   Email: email1@example.com
   Phone: +X-XXX-XXX-XXXX
   Relationship: [e.g., Thesis Advisor, Manager, etc.]

2. **Reference Person 2**
   Job Title, Department
   Organization/Institution Name
   Email: email2@example.com
   Phone: +X-XXX-XXX-XXXX
   Relationship: [e.g., Project Supervisor, Colleague, etc.]

3. **Reference Person 3**
   Job Title, Department
   Organization/Institution Name
   Email: email3@example.com
   Phone: +X-XXX-XXX-XXXX
   Relationship: [e.g., Mentor, Collaborator, etc.]

Last Update: 09/2024