

JUNYI GAO

University of Edinburgh
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EDUCATION

University of Edinburgh Supervisor: Prof. Ewen Harrison PhD student funded by the HDR UK-Turing Wellcome UK program	Edinburgh, UK Oct 2022 – Present
University of Illinois Urbana-Champaign Supervisor: Prof. Jimeng Sun Master in Computer Science (Transferred from the PhD program)	Illinois, US Aug 2020 – May 2022
Beihang University B.Eng. in Software Engineering (Honored Graduate)	Beijing, China Sep 2015 – Jul 2019

PUBLICATIONS

* indicates equal contribution

[Nature Comm.]	Evidence-Driven Spatio-Temporal COVID-19 Hospitalization Prediction with Ising Dynamics Junyi Gao , Joerg Heintz, Christina Mack, Lucas Glass, Adam Cross, Jimeng Sun <i>Nature Communications</i> , IF: 17.7 , 2023
[KDD 2023]	PyHealth: A Deep Learning Toolkit For Healthcare Applications Chaoqi Yang*, Zhenbang Wu*, Patrick Jiang, Zhen Lin, Junyi Gao , Benjamin Danek, Jimeng Sun <i>ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD)</i> , Tutorial Track, 2023
[Cell iScience]	MedML: Fusing Medical Knowledge and Machine Learning Models for Early Pediatric COVID-19 Hospitalization and Severity Prediction Junyi Gao , Chaoqi Yang, George Heintz, Scott Barrows, Elise Albers, Mary Stapel, Sara Warfield, Adam Cross, Jimeng Sun <i>Cell iScience</i> , IF: 6.1 , 2022.
[Nature Sci. Data]	The United States COVID-19 Forecast Hub Dataset Estee Y. Cramer, et al. [US COVID-19 Forecast Hub Consortium, including Junyi Gao] <i>Nature Scientific Data</i> , IF 8.5 , 2022.
[WWW 2022]	PopNet: Real-Time Population-Level Disease Prediction with Data Latency Junyi Gao , Cao Xiao, Lucas Glass, Jimeng Sun <i>The World Wide Web Conference (WWW)</i> , Oral , 2022
[JAMIA]	STAN: Spatio-Temporal Attention Network for Pandemic Prediction Using Real World Evidence Junyi Gao , Rakshith Sharma, Cheng Qian, Lucas M Glass, Jeffrey Spaeder, Justin Romberg, Jimeng Sun, Cao Xiao <i>Journal of the American Medical Informatics Association</i> , IF: 7.9 , 2021
[WWW 2021]	CovidCare: Transferring Knowledge from Existing EMR to Emerging Epidemic for Interpretable Prognosis Liantao Ma, Xinyu Ma, Junyi Gao , Chaohe Zhang, Zhihao Yu, Xianfeng Jiao, Wenjie Ruan, Yasha Wang, Wen Tang, Jiangtao Wang <i>The World Wide Web Conference (WWW)</i> , Oral , 2021
[KDD 2020]	COMPOSE: Cross-Modal Pseudo-Siamese Network for Patient Trial Matching Junyi Gao , Cao Xiao, Lucas Glass, Jimeng Sun <i>ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD)</i> , Oral , 2020
[JAMIA]	Dr. Agent: Clinical Predictive Model via Simulated Second Opinions Junyi Gao , Cao Xiao, Lucas Glass, Jimeng Sun <i>Journal of the American Medical Informatics Association</i> , IF: 7.9 , 2020

- [WWW 2020] **StageNet: Stage-Aware Neural Networks for Health Risk Prediction**
Junyi Gao, Cao Xiao, Yasha Wang, Lucas Glass, Wen Tang, Jimeng Sun
The World Wide Web Conference (WWW), **Oral**, 2020
- [AAAI 2020] **AdaCare: Explainable Clinical Health Status Representation Learning via Scale-Adaptive Feature Extraction and Recalibration**
Liantao Ma, Junyi Gao, Yasha Wang, Chaohe Zhang, Jiangtao Wang, Wenjie Ruan, Wen Tang, Xin Gao, Xinyu Ma
AAAI Conference on Artificial Intelligence (AAAI), **Oral**, 2020
- [AAAI 2020] **ConCare: Personalized Clinical Feature Embedding via Capturing the Healthcare Context**
Liantao Ma, Chaohe Zhang, Yashang Wang, Wenjie Ruan, Jiangtao Wang, Wen Tang, Xinyu Ma, Junyi Gao
AAAI Conference on Artificial Intelligence (AAAI), 2020
- [ICDM 2019] **CAMP: Co-Attention Memory Networks for Diagnosis Prediction in Healthcare**
Jingyue Gao, Xiting Wang, Yasha Wang, Zhao Yang, Junyi Gao, Jiangtao Wang, Wen Tang, Xing Xie
IEEE International Conference on Data Mining (ICDM), 2019
- [UIC 2019] **MUSEFood: Multi-sensor-based Food Volume Estimation on Smartphones**
Junyi Gao*, Weihao Tan*, Liantao Ma, Yasha Wang and Wen Tang
The 16th IEEE International Conference on Ubiquitous Intelligence and Computing, **Oral**, 2019
- [J. PKU] **Applications of Recurrent Neural Network in Clinical Prognosis Prediction of Peritoneal Dialysis**
Wen Tang, Junyi Gao, Xinyu Ma, Chaohe Zhang, Liantao Ma, Yasha Wang
Journal of Peking University (Health Sciences), 2019
- [PCC 2018] **Multi-sensor Integrated Food Volume Measurement Based on Smartphone**
Zhengtong shi, Junyi Gao, Liantao Ma, Yasha Wang, Jiangtao Wang, Wen Tang
The 14th Conference on Pervasive Computing of China, **Oral**, 2018

WORKSHOPS & ABSTRACTS

- [AMIA-PA 2023] **A Comprehensive Benchmark For COVID-19 Predictive Modeling Using Electronic Health Records in Intensive Care**
Junyi Gao, Yinghao Zhu, Wenqing Wang, Yasha Wang, Wen Tang, Liantao Ma
AMIA 2023 Informatics Summit (AMIA), Podium Abstract Track, 2023.
- [KDD-UG 2022] **COVID Forecaster: Interactive Visualizations of COVID Forecasts with Deep Learning**
Andrew Wang, Junyi Gao*, Jimeng Sun*
ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD), Undergraduate Consortium Track, 2022.
- [PDS-ICPE 2021] **Two Machines are Better Than One: Using Multi-agent Reinforcement Learning to Simulate a Clinical Second Opinion**
Cao Xiao, Junyi Gao, Lucas Glass, Jimeng Sun, Christina Mack
Pharmacoepidemiology and Drug Safety, Abstracts of the 36th International Conference on Pharmacoepidemiology & Therapeutic Risk Management, 2021
- [JCO-ASCO 2020] **Patient Trial Matching Using Pseudo-Siamese Network**
Cao Xiao, Junyi Gao, Lucas Glass, Jimeng Sun
Journal of Clinical Oncology, Abstracts of 2020 American Society of Clinical Oncology Annual Meeting, 2020

RESEARCH EXPERIENCE

- *Sunlab, UIUC* *Urbana, IL*
Research assistant, advised by Prof. Jimeng Sun Aug 2020 – May 2022
Lead research projects for spatio-temporal healthcare predictions in collaborating with OSF Healthcare;
Lead research projects for COVID-19 related predictions with the US National COVID Cohort Collaborative (N3C).

- *Analytics Center of Excellence, IOVIA* *Beijing, China*
Intern machine learning researcher, advised by Dr. Cao Xiao May 2019 – Present
Lead research projects for clinical phenotyping and clinical trial optimization using US claims data and MIMIC-III Intensive Care Unit data.
- *National Software Engineering Research Centre, Peking University* *Beijing, China*
Research assistant, advised by Prof. Yasha Wang June 2017 – Aug 2020
Participate in research projects for clinical risk prediction and nutrition intake recommendation for chronic kidney disease patients in collaborating with the Peking University Third Hospital.

APPLICATION PROJECTS

- *Peking University Third Hospital* *Beijing, China*
Dr. Vis July 2019 – Aug 2020
Lead the team to develop an interactive visualization system for Electronic Health Record data
Chronic Kidney Disease Management Application June 2017 – July 2019
Lead the team to develop mobile apps for hospital documents automatic recognition, food and nutrient intakes automatic measurement and disease progression tracking.
- *OSF Healthcare* *IL, the US*
Routing planning web app for Care-A-VAN mobile health center July 2021 – Dec 2021
Develop a web application for vaccination van route planning. Responsible for developing deep-based backend vaccine shot need prediction models.

SELECTED AWARDS AND HONORS

- 3rd prize (Top 3 out of all teams), Predicting High Risk Breast Cancer: a Nightingale OS & AHLI data challenge 2023
- 3rd prize (Top 3 out of 14 teams from US universities), Big Ten Augmented Intelligence Bowl 2021
- Honored Graduate of Beihang University 2019
- AAAI 2020 Student Travel Award 2019
- Meritorious Winner (Top 10%), Mathematical Contest in Modeling, COMAP 2018
- Scholarship of Academic Excellence (Top 5%), Beihang University 2018
- Scholarship of Science and Technology Competition (Top 1%), Beihang University 2017 & 2018
- 1st prize (Top 10 out of candidates of all majors), Feng Ru Cup Competition, Beihang University 2016

INVITED TALKS AND MEDIA COVERAGE

- Invited talk for the High Risk Breast Cancer Prediction Challenge at ML4H 2022, 2022.11.
- Invited talk for the COVID-19 hospitalization prediction paper MedML at the N3C Fourm, 2022.10.
- Invited talk on AI Time Seminar in Tsinghua University, 2020.09.
- China national flagship channel CCTV-1 made a special program for our project AdaCare and Dr. Vis, 2020.07.

SERVICES

Reviewer / Program Committee member

- IEEE Transactions on Knowledge and Data Engineering (TKDE)
- Machine Learning for Healthcare Conference (ML4H)
- ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD)
- American Medical Informatics Association Annual Symposium (AMIA)
- Journal of the American Medical Informatics Association (JAMIA)
- IEEE Transactions on Signal and Information Processing over Networks (SIPN)
- Spatial and Spatio-temporal Epidemiology (SSTE)

Teaching

- Program Design (TA) Spring 2017
- Technical Writing for Graduate (TA) Spring 2018 & Autumn 2018

PATENTS

- Yasha Wang, Liantao Ma, Xianfeng Jiao, Jiahui Zhou, **Junyi Gao**, and Chaohe Zhang. Method and device for determining potential important information of patient, CN 202010946290.4, filed Oct 09, 2020.
- Yasha Wang, Weihao Tan, Wen Tang, **Junyi Gao**, and Liantao Ma. Sound wave and image fused food volume measurement method and system in smartphone, CN 202010862933.7, filed Aug 25, 2020.