# JUNYI GAO

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## EDUCATION

**University of Edinburgh**                                                                                                  Edinburgh, UK
**Supervisor:** Prof. Ewen M. Harrison
PhD student funded by the HDR UK-Turing Wellcome program                                 Oct 2022 – Present

**University of Illinois at Urbana-Champaign**                                                                          Illinois, US
**Supervisor:** Prof. Jimeng Sun
Master in Computer Science (Transferred from the PhD program)                          Aug 2020 – May 2022

**Beihang University**                                                                                                         Beijing, China
B.Eng. in Software Engineering **(Honored Graduate)**                                          Sep 2015 – Jul 2019

## PUBLICATIONS

* indicates equal contribution; + indicates corresponding author

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|---|---|
| [Cell Patterns] | **A Comprehensive Benchmark for COVID-19 Predictive Modeling Using Electronic Health Records in Intensive Care**<br>**Junyi Gao\***, Yinghao Zhu\*, Wenqing Wang\*, Guiying Dong, Wen Tang, Hao Wang, Yasha Wang, Ewen M Harrison, Liantao Ma<br>*Patterns*, **IF: 6.5**, 2024 |
| [Cell Patterns] | **Mortality Prediction with Adaptive Feature Importance Recalibration for Peritoneal Dialysis Patients**<br>Liantao Ma\*, Chaohe Zhang\*, **Junyi Gao\*+**, Xianfeng Jiao, Zhihao Yu, et al.<br>*Patterns,* **IF: 6.5, Cover Paper**, 2023 |
| [JAMIA] | **Multi-Faceted Analysis and Prediction for the Outbreak of Pediatric Respiratory Syncytial Virus**<br>Chaoqi Yang, **Junyi Gao**, Lucas Glass, Adam Cross, Jimeng Sun<br>*Journal of the American Medical Informatics Association*, **IF: 7.9**, 2023 |
| [Nature Comm.] | **Evidence-Driven Spatio-Temporal COVID-19 Hospitalization Prediction with Ising Dynamics**<br>**Junyi Gao**, Joerg Heintz, Christina Mack, Lucas Glass, Adam Cross, Jimeng Sun<br>*Nature Communications*, **IF: 17.7**, 2023 |
| [KDD 2023] | **PyHealth: A Deep Learning Toolkit For Healthcare Applications**<br>Chaoqi Yang\*, Zhenbang Wu\*, Patrick Jiang, Zhen Lin, **Junyi Gao**, Benjamin Danek, Jimeng Sun<br>*ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD)*, Tutorial Track, 2023 |
| [Cell iScience] | **MedML: Fusing Medical Knowledge and Machine Learning Models for Early Pediatric COVID-19 Hospitalization and Severity Prediction**<br>**Junyi Gao**, Chaoqi Yang, George Heintz, Scott Barrows, Elise Albers, Mary Stapel, Sara Warfield, Adam Cross, Jimeng Sun<br>*iScience*, **IF: 6.1**, 2022. |
| [Nature Sci. Data] | **The United States COVID-19 Forecast Hub Dataset**<br>Estee Y. Cramer, et al. [US COVID-19 Forecast Hub Consortium, including **Junyi Gao**]<br>Nature Scientific Data, **IF 8.5**, 2022. |
| [WWW 2022] | **PopNet: Real-Time Population-Level Disease Prediction with Data Latency**<br>**Junyi Gao**, Cao Xiao, Lucas Glass, Jimeng Sun<br>*The World Wide Web Conference (WWW)*, **Oral**, 2022 |
| [JAMIA] | **STAN: Spatio-Temporal Attention Network for Pandemic Prediction Using Real World Evidence**<br>**Junyi Gao**, Rakshith Sharma, Cheng Qian, Lucas M Glass, Jeffrey Spaeder, Justin Romberg, |

Jimeng Sun, Cao Xiao
*Journal of the American Medical Informatics Association*, **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
*The World Wide Web Conference (WWW)*, **Oral**, 2021

**[KDD 2020]**    **COMPOSE: Cross-Modal Pseudo-Siamese Network for Patient Trial Matching**
**Junyi Gao**, Cao Xiao, Lucas Glass, Jimeng Sun
*ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD)*, **Oral**, 2020

**[JAMIA]**    **Dr. Agent: Clinical Predictive Model via Simulated Second Opinions**
**Junyi Gao**, Cao Xiao, Lucas Glass, Jimeng Sun
*Journal of the American Medical Informatics Association*, **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

**[HDS 2023]**    **M3Fair: Mitigating Bias in Healthcare Data through Multi-Level and Multi-Sensitive-Attribute Reweighting Method**
Yinghao Zhu, Jingkun An, Enshen Zhou, Lu An, **Junyi Gao**, Hao Li, HaoranFeng, Bo Hou, Wen Tang, Chengwei Pan, Liantao Ma
*Health Data Science Conference 2023 (HDS), 2023*

**[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

## WORKING 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 and IQVIA; Lead research projects for COVID-19 related predictions with the US National COVID Cohort Collaborative (N3C).

- *Analytics Center of Excellence, IQVIA*  *Beijing, China*

  *Intern machine learning researcher, advised by Dr. Cao Xiao*  May 2019 – Nov 2023

  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.

## SELECTED AWARDS AND HONORS

- Reviewer Award, AMIA  2024
- 3rd prize (Top 3 out of all teams), Predicting High Risk Breast Cancer: a Nightingale OS & AHLI data challenge  2023
- HDRUK-Wellcome PhD Funding (£100,000)  2022
- 3rd prize (Top 3 out of all 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 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

**Conference Program Committee Member & Reviewer**
- The International Conference on Machine Learning (ICML) 2024
- The International Conference on Learning Representations (ICLR) 2024
- The Annual Conference on Neural Information Processing Systems (NeurIPS) 2024

- Machine Learning for Healthcare Conference (ML4H) 2022, 2023, 2024
- ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD) 2023
- American Medical Informatics Association Annual Symposium (AMIA AS) 2023
- American Medical Informatics Association Informatics Summit (AMIA IS) 2024
- American Medical Informatics Association Clinical Informatics Conference (AMIA CIC) 2024
- SIAM International Conference on Data Mining (SDM) 2024

**Journal Reviewer**
- IEEE Transactions on Knowledge and Data Engineering (TKDE)
- IEEE Journal of Biomedical and Health Informatics (JBHI)
- IEEE Transactions on Signal and Information Processing over Networks (SIPN)
- Spatial and Spatio-temporal Epidemiology (SSTE)
- Journal of the American Medical Informatics Association (JAMIA)
- International Journal of Digital Earth (IJDE)

**Misc**
- Co-organizer of KDD'24 workshop "Artificial Intelligence and Data Science for Healthcare:Bridqing Data-Centric AI and People-Centric Healthcare" Aug 2024
- Panel member of HDRUK PhD program recruitment team 2023
- Teaching assistant - Foundations of software development in health and social care Spring 2024
- Teaching assistant - Program Design Spring 2017
- Teaching assistant - Technical Writing for Graduate 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.