Jintai Chen

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GOOGLE SCHOLAR:	https://scholar.google.com/citations?user=ZiY3xYEAAAAJ

EDUCATION & KEY EXPERIENCE

Aug. 2023 -   **University of Illinois Urbana-Champaign**   Illinois, US
Postdoc Researcher at Computer Science Department
Advisor: Professor Jimeng Sun

2018 - 2023   **Zhejiang University**   Hangzhou, China
College of Computer Science and Technology
Ph.D in Computer Science and Technology, with honor
Excellent Doctoral Graduates of Zhejiang Province, China
Advisor: Professor Jian Wu

2014 - 2018   **Zhongnan University of Economics and Law**   Wuhan, China
School of Statistics and Mathematics
B.S. in Applied Statistics, with honor

RESEARCH SUMMARY

My research interests lie at the intersection of machine learning and healthcare (ML4HC), with a particular emphasis on developing **medical knowledge-aware machine learning** algorithms and leveraging **machine learning for medical knowledge discovery**. My work spans several cutting-edge domains, including AI-driven medical imaging analysis, ECG analysis, electronic health record (EHR) analysis, and AI applications in clinical trial design and simulation. Methodologically, I concentrate on advancing deep tabular learning, digital twin creation algorithm, medical vision, and large language models.

SELECTED PUBLICATIONS

†= co-first authors, * = corresponding author(s)

1. **Congenital heart disease detection by pediatric electrocardiogram based deep learning integrated with human concepts**
   Jintai Chen†, Shuai Huang†, Ying Zhang†, Qing Chang†, Dantong Li, Jia Qiu, Lianting Hu, Xiaoting Peng, Yunmei Du, Yunfei Gao, Danny Z. Chen, Abdelouahab Bellou*, Jian Wu*, Huiying Liang*, Nature Communications, IF:17.694, 2024

2. **TabCaps: A capsule neural network for tabular data classification with BoW routing**
   Jintai Chen, Kuanlun Liao, Yanwen Fang, Danny Z. Chen, Jian Wu*
   International Conference on Learning Representations (ICLR-2023, CORE A*; TH-CL A)

3. **ME-GAN: Learning panoptic electrocardio representations for multi-view ECG synthesis conditioned on heart diseases**
   Jintai Chen†, Kuanlun Liao†, Kun Wei, Haochao Ying, Danny Z. Chen, Jian Wu*
   International Conference on Machine Learning (ICML-2022, CORE A*; TH-CL A; CCF A)

4. **Electrocardio panorama: Synthesizing new ECG views with self-supervision**
   Jintai Chen†, Xiangshang Zheng†, Hongyun Yu†, Danny Z. Chen, Jian Wu*
   International Joint Conference on Artificial Intelligence (IJCAI-2021, CORE A*; CCF A)

5. **A receptor skeleton for capsule neural networks**

Jintai Chen, Hongyun Yu, Chengde Qian, Danny Z. Chen, Jian Wu*
International Conference on Machine Learning (ICML-2021, CORE A*; TH-CL A; CCF A)

6. **ExcelFormer: Can a DNN be a Sure Bet for Tabular Prediction?**
Jintai Chen†, Jiahuan Yan†, Qiyuan Chen, Danny Ziyi Chen, Jian Wu, Jimeng Sun*
SIGKDD Conference on Knowledge Discovery and Data Mining (SIGKDD-24, CORE A*; TH-CL A; CCF A)

7. **DANETs: Deep Abstract Networks for tabular data classification and regression**
Jintai Chen, Kuanlun Liao, Yao Wan, Danny Z. Chen, Jian Wu*
AAAI Conference on Artificial Intelligence (AAAI-2022, CORE A*; TH-CL A; CCF A)

8. **A hierarchical graph network for 3D object detection on point clouds**
Jintai Chen†, Biwen Lei†, Qingyu Song†, Haochao Ying, Danny Z Chen, Jian Wu*
CVF/IEEE Conference on Computer Vision and Pattern Recognition (CVPR-2020, CORE A*; TH-CL A; CCF A)

9. **T2G-Former: Organizing tabular features into relation graphs promotes heterogeneous feature interaction**
Jiahuan Yan†, Jintai Chen†, Yixuan Wu, Danny Z. Chen, Jian Wu*
AAAI Conference on Artificial Intelligence (AAAI-2023, oral presentation, CORE A*; TH-CL A; CCF A)

10. **Making Pre-trained Language Models Great on Tabular Prediction**
Jiahuan Yan, Bo Zheng, Hongxia Xu, Yiheng Zhu, Danny Chen, Jimeng Sun, Jian Wu*, Jintai Chen*
International Conference on Learning Representations (ICLR-2024, spotlight presentation (5%); CORE A*; TH-CL A)

11. **Personalized Heart Disease Detection via ECG Digital Twin Generation**
Yaojun Hu, Jintai Chen*, Lianting Hu, Dantong Li, Jiahuan Yan, Haochao Ying, Huiying Liang, Jian Wu
International Joint Conference on Artificial Intelligence (IJCAI-2024, CORE A*; CCF A)

12. **Team up GBDTs and DNNs: Advancing Efficient and Effective Tabular Prediction with Tree-hybrid MLPs**
Jiahuan Yan, Jintai Chen*, QianXing Wang, Danny Chen, Jian Wu
SIGKDD Conference on Knowledge Discovery and Data Mining (SIGKDD-24, CORE A*; TH-CL A; CCF A)

13. **Ord2Seq: Regarding Ordinal Regression as Label Sequence Prediction**
Jinhong Wang†, Yi Cheng†, Jintai Chen*, Tingting Chen, Danny Chen, Jian Wu*
CVF/IEEE International Conference on Computer Vision (ICCV-2023, CORE A*; TH-CL A; CCF A)

14. **GCL: Gradient-Guided Contrastive Learning for Medical Image Segmentation with Multi-Perspective Meta Labels**
Yixuan Wu, Jintai Chen*, Jiahuan Yan, Yiheng Zhu, Danny Chen, Jian Wu*
ACM International Conference on Multimedia (ACM MM-2023, CORE A*; TH-CL A; CCF A)

15. **Cross-Layer retrospective retrieving via layer attention**
Yanwen Fang, Yuxi Cai, Jintai Chen, Jingyu Zhao, Guangjian Tian, Guodong Li*
International Conference on Learning Representations (ICLR-2023, CORE A*; TH-CL A)

16. **Doctor imitator: A graph-based bone age assessment framework using hand radiographs**
Jintai Chen†, Bohan Yu†, Biwen Lei†, Ruiwei Feng, Danny Z Chen, Jian Wu*
International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI-2020, oral presentation; CORE A)

17. **LSRC: A long-short range context-fusing framework for automatic 3D vertebra localization**
Jintai Chen†, Yanjie Wang†, Ruoqian Guo†, Bohan Yu, Tingting Chen, Wenzhe Wang, Ruiwei Feng, Danny Z Chen, Jian Wu*
International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI-2019, CORE A)

18. **LKM-UNet: Large kernel vision mamba UNet for medical image segmentation**
Jinhong Wang, Jintai Chen*, Danny Z. Chen, Jian Wu
International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI-2024, CORE A)

19. **TeleOR: Real-time remote operating room**
Yixuan Wu†, Kaiyuan Hu†, Qian Shao, Jintai Chen*, Danny Z. Chen, Jian Wu
International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI-2024, CORE A)

20. **Flow-Mixup: Classifying multi-labeled medical images with corrupted labels**
Jintai Chen, Hongyun Yu, Ruiwei Feng, Danny Z Chen, Jian Wu*
IEEE International Conference on Bioinformatics and Biomedicine (BIBM-2020)

21. `TWIN-GPT:` **Digital Twins for Clinical Trials via Large Language Model**
Yue Wang†, Tianfan Fu†, Yinlong Xu, Zihan Ma, Hongxia Xu, Bang Du, Yingzhou Lu, Honghao Gao*, Jian Wu, Jintai Chen*
ACM Transactions on Multimedia Computing Communications And Applications (TOMM, IF:5.1), June, 2024.

22. **Self-learning and one-shot learning based single-slice annotation for 3D medical image segmentation**
Yixuan Wu, Bo Zheng, Jintai Chen, Danny Z Chen, Jian Wu*
The Twenty-fifth International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI-2022, oral presentation; CORE A)

23. **A deep learning approach for colonoscopy pathology WSI analysis: Accurate segmentation and classification**
Ruiwei Feng†, Xuechen Liu†, Jintai Chen, Danny Z Chen, Honghao Gao, Jian Wu*
IEEE Journal of Biomedical and Health Informatics (J-BHI, IF:7.021), October, 2021

24. **Interactive few-shot learning: Limited supervision, better medical image segmentation**
Ruiwei Feng†, Xiangshang Zheng†, Tianxiang Gao†, Jintai Chen, Wenzhe Wang, Danny Z Chen, Jian Wu*
IEEE Transactions on Medical Imaging (T-MI, IF:11.037), October, 2021

25. **A semi-supervised deep convolutional framework for signet ring cell detection**
Haochao Ying, Qingyu Song, Jintai Chen, Tingting Liang, Jingjing Gu, Fuzhen Zhuang, Danny Z Chen, Jian Wu*
Neurocomputing (IF: 6.0), September, 2021

26. **D-Former: A U-shaped dilated Transformer for 3D medical image segmentation**
Yixuan Wu, Kuanlun Liao, Jintai Chen, Jinhong Wang, Danny Z Chen, Jian Wu*
Neural Computing and Applications (IF: 6.0), October, 2022

27. **Multi-view learning with feature level fusion for cervical dysplasia diagnosis**
Tingting Chen, Xinjun Ma, Xuechen Liu, Wenzhe Wang, Ruiwei Feng, Jintai Chen, Chunnv Yuan, Weiguo Lu, Danny Z Chen, Jian Wu*
Medical Image Computing and Computer Assisted Intervention (MICCAI), October, 2019

Selected Patents

(the first inventor among students)

US Patent	**A DRGs Automatic Grouping Method based on a Convolutional Neural Network** Jian Wu, **Jintai Chen**, Tingting Chen, Haochao Ying, Biwen Lei, Qingyu Song, Xuechen Liu, Xiaohong Jiang, Jiucheng Zhang
CN Patent	**A 3D-2D Method for Spinal Bone Detection** Jian Wu, **Jintai Chen**, Bohan Yu, Ruoqian Guo
CN Patent	**A Transfer Learning Method in Constructing Super-Resolution Pathological Microscopes** Jian Wu, **Jintai Chen**, Xuechen Liu,
CN Patent	**A Machine Learning-based Temperature Correction System for CRRT Patients** Jian Wu, **Jintai Chen**, Tingting Chen, Haochao Ying, Biwen Lei, Xuechen Liu, Qingyu Song, Xiaojun Chen, Na Yang, Xiaoling Wang
CN Patent	**A System for Cone Cornea Recognition based on Multi-Dimensional Feature Adaptive Fusion** Jian Wu, **Jintai Chen**, Tingting Chen, Haochao Ying, Ruiwei Feng, Biwen Lei, Xuechen Liu, Qingyu Song, Heping Hu
CN Patent	**A Machine Learning-based Predictive Device for Personalized Ovulation Induction Regimens** Jian Wu, **Jintai Chen**, Tingting Chen, Ruiwei Feng, Haochao Ying, Biwen Lei, Xuechen Liu, Qingyu Song, Yan Cao
CN Patent	**A Deep Learning System for Tear Film Breakup Time Forecasting** Jian Wu, **Jintai Chen**, Tingting Chen, Haochao Ying, Biwen Lei, Xuechen Liu, Qingyu Song, Heping Hu
CN Patent	**A weakly supervised deep learning automatic bone age assessment method** Jian Wu, **Jintai Chen**

VISITING & INTERNSHIP

Jun. - Sep., 2022	**DAMO Academy, Alibaba** Research Intern
Jun. - Sep., 2021	**Medical Big Data Center, Guangdong Academy of Medical Sciences** Visiting Scholar Working closely with Professor Huiying Liang

AWARDS

2023	Excellent Doctoral Graduates of Zhejiang Province, China (Top 1%)
2023	Excellent Doctoral Graduates of Zhejiang University, China (Top 1%)
2022	Huawei Foundation Research Scholarship (Top 3%)
2022	Second Prize Award for Technological Advancement, Chinese Institute of Electronics
2022	Chinese (Huaxia) Medical Science and Technology Award, China International Exchange and Promotive Association for Medical and Health Care
2021	National Scholarship of China (Top 1%)
2021	Tencent Scholarship (Top 1%)
2021	Invention and Entrepreneurship Award, China Association of Inventions
2020	Outstanding Ph.D. Student Scholarship, Zhejiang University (Top 3%)
2019	Doctoral Freshman Scholarship, Zhejiang University (Top 3%)
2016	Chinese Bank Scholarship (Top 1%)
2015	National Scholarship of China (Top 1%)
2015, 2016	First Prize Scholarship, Undergraduate (Top 3%)

Monitoring

ZJU	Jiahuan Yan, Yixuan Wu, Jinhong Wang, Wenhao Zheng, Hanjin Zhou, Hongyun Yu, Yue Wang, Qiyuan Chen, Yaojun Hu
UIUC	Chufan Gao, Shrusti Jain, Trisha Das
Others	Yuexin Bian (UCSD), Yanwen Fang (HKU)

Teaching Experience

- 2017 Fall, Prof. Yanqing Wang's course "Semi-parametric statistics" TA
- 2017 Fall, Prof. Lin Jin's course "Multivariate Statistical Analysis" TA
- 2022 Spring, Prof. Jian Wu's course "Frontiers of Medical Artificial Intelligence" TA
- 2023 PhD Qualification Examination Question Setting, UIUC

Talks

Nov., 2022	How to conduct researches on Medical AI, @ Shanghai University
Oct., 2022	ECG Signal Processing and Synthesis for Heart disease diagnosis, @ Carnegie Mellon University
Oct., 2022	ECG Synthesis for New View and New Data, @ Shanghai AI Lab
Sept., 2022	Part Hierarchy Learning, @ ByteDance AI Lab
Nov., 2022	Tabular Data Processing, @ UberAI
Nov., 2022	Domain Mixup for distant transfer learning, @ Shanghai Jiao Tong University

Professional Services

Program Committee Member: ICLR, ICML, NeurIPS, CVPR, ICCV, ECCV, ACL, KDD, EMNLP, AAAI, IJCAI, MICCAI, ISBI

Journal Article Reviewer: TNNLS, JBHI, TCBB, Frontiers in Public Health, JBSM, TCDS

References

- Professor Jian Wu (Ph.D. Advisor)
  - Professor in College of Computer Science, Zhejiang University (ZJU)
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  - Email: dchen@nd.edu
- Professor Huiying Liang (Co-author)
  - Director of Medical Big Data Center, Guangdong Provincial People's Hospital
  - Distinguished Professor in South China University of Technology
  - Email: lianghuiying@hotmail.com