JIACHENG ZHU

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EDUCATION

M.S. in Machine Learning, *Machine Learning Department* — *Dec 2019 - Jan 2022*
School of Computer Science, Carnegie Mellon University, PA, USA

Ph.D. Candidate, *Mechanical Engineering* — *Sept 2018 - Present*
College of Engineering, Carnegie Mellon University, PA, USA

Minor in Data Science, — *Sept 2015 - June 2017*
School of Computer Science, Fudan University, Shanghai, China

B.Eng. in Aerospace design and Engineering, — *Sept 2013 - June 2017*
School of Aeronautics and Astronautics, Fudan University, Shanghai, China

CURRENT RESEARCH

Jiacheng Zhu's research target is to develop interpretable machine learning techniques that transport and utilize knowledge across different domains. To achieve this goal, he leverages probabilistic theory, Bayesian inference, and optimal transport. He tackles machine learning problems on heterogeneous real-world datasets in robotics, autonomous driving, and healthcare.

SELECTED PUBLICATIONS & PREPRINTS

1. **Functional Optimal Transport: map estimation and domain adaptation for functional data**,
Jiacheng Zhu*, Aritra Guha*, Dat Do*, Mengdi Xu, XuanLong Nguyen, Ding Zhao, *submitted to Journal of Machine Learning Research, under review.*

2. **Semantics-Consistent Cross-domain Summarization via Optimal Transport Alignment**, Jielin Qiu, **Jiacheng Zhu**, Mengdi Xu, Frank Dernonocourt, Trung Bui, Zhaowen Wang, Bo Li, Ding Zhao, Hailin Jin, *Under review.*

3. **Curriculum Reinforcement Learning using Optimal Transport via Gradual Domain Adaptation**,
Peide Huang, Mengdi Xu, **Jiacheng Zhu**, Laixi Shi, Fei Fang, Ding Zhao, *Conference on Neural Information Processing Systems (NeurIPS 2022).*

4. **GeoECG: Data Augmentation via Wasserstein Geodesic Perturbation for Robust Electrocardiogram Prediction**,
Jiacheng Zhu*, Jielin Qiu*, Zhuolin Yang, Douglas Weber, Michael Rosenberg, Emerson Liu, Bo Li, Ding Zhao, *PMLR Machine Learning for Healthcare (MLHC) 2022.*

5. **PhysioMTL: Personalizing Physiological Patterns using Optimal Transport Multi-Task Regression**,
Jiacheng Zhu, Gregory Darnell, Agni Kumar, Ding Zhao, Bo Li, XuanLong Nguyen, Shirley You Ren, *Conference on Health, Inference, and Learning (CHIL) 2022, PMLR.*

6. **Context-Aware Safe Reinforcement Learning for Non-Stationary Environments**
Baiming Chen, Zuxin Liu, **Jiacheng Zhu**, Mengdi Xu, Wenhao Ding, Liang Li, Ding Zhao
The 2021 International Conference on Robotics and Automation (ICRA 2021).

7. **Spatiotemporal learning of multivehicle interaction patterns in lane-change scenarios**
   Chengyuan Zhang, **Jiacheng Zhu**, Wenshuo Wang, Junqiang Xi, *IEEE Transactions on Intelligent Transportation Systems, 2021.*

8. **Task-Agnostic Online Reinforcement Learning with an Infinite Mixture of Gaussian Processes**
   Mengdi Xu, Wenhao Ding, **Jiacheng Zhu**, Zuxin Liu, Baiming Chen, Ding Zhao, *Conference on Neural Information Processing Systems (NeurIPS 2020).*

9. **Recurrent Attentive Neural Process for Sequential Data**
   Shenghao Qin*, **Jiacheng Zhu***, Jimmy Qin, Wenshuo Wang, Ding Zhao, *Conference on Neural Information Processing Systems (NeurIPS 2019) Workshop.*

10. **Probabilistic Trajectory Prediction for Autonomous Vehicles with Recurrent Attentive Neural Process**
    Jiacheng Zhu*, Shenghao Qin*, Wenshuo Wang, Ding Zhao, *preprint.*

11. **A Tempt to Unify Heterogeneous Driving Databases using Traffic Primitives**
    Jiacheng Zhu, Wenshuo Wang, Ding Zhao, *The 21st IEEE International Conference on Intelligent Transportation Systems (ITSC) 2018.*

12. **A theoretical model for delayed hydride cracking velocity considering the temperature history and temperature gradients**
    Jingyu Zhang, **Jiacheng Zhu**, Shurong Ding,etc., Nuclear Materials and Energy 16 (2018): 95-107.

13. **Evaluation of the Effect of Temperature Gradient and Irradiation on Threshold Stress Intensity Factor in Delayed Hydride Cracking and Simulation on DHC Velocity for Zirconium Alloy Cladding Tubes**
    Jiacheng Zhu, Jingyu Zhang, Shurong Ding,etc. oral report, proceedings with the 19th Conference on Structural Mechanics in Reactor Technology, Beijing, China, Oct 16-18, 2016

WORK EXPERIENCE

AT & T Labs June 2022-Aug 2022
Research Scientist Intern - Statistics Research *New York, NY*

· Develop machine learning techniques that eliminate distribution shift and promote fairness

Apple AI/ML May 2021-Oct 2021
Research Scientist Intern - Health AI *Seattle, WA*

· Developed Physiology-informed machine learning methodologies
· Proposed PhysioMTL - a multi-task learning framework with Optimal Transport methods that provides personalized physiological assessment from Heart Rate Variability (HRV)

Isuzu Technical Center of America May 2020-Sep 2020
Research Enginner Intern - Decision Making for Autonomous Driving *Ann Arbor, MI*

· Developed a Decision-Making Module based on online trajectory prediction with deep generative models.
· Conducted the domain adaptation from public dataset to testing domain for real-world deployment

Etiger Capital Partners LLC Jun 2017-Aug 2017
Quantitative Analyst - Data Mining & Analysis *Shanghai, China*

· Independently built a Business-News-NLP Arbitrage on China's A-share stock market based on Hidden Markov Model (HMM), and Naive Bayes Classifier for identifying profitable opportunities

SELECTED PROFESSIONAL SERVICES

Reviewer ICML (2021, 2022), NeurIPS (2021, 2022), ICLR (2022, 2023), AAAI 2023, MLHC 2022, CHIL 2022, TITS, ITSC 2018

TALKS & ACTIVITIES

Robustify ECG Automatic diagnosis via distribution interpolation Sep 2022
Long talk *Allegheny Health Network, Pittsburgh*

GeoECG: Data augmentation for robust cardiovascular prediction Aug 2022
Spotlight presentation *Machine Learning for Healthcare, 2022, Durham, North Carolina*

PhysioMTL: Physiology-informed multi-task Learning April 2022
Spotlight presentation *Conference on Health, Inference, and Learning, 2022*

Functional Optimal Transport February 2022
Spotlight presentation *AAAI Workshop on Optimal Transport and Structured Data Modeling*

Demographic aware multitask learning for Heart Rate Variability August 2021
Intern presentation *Apple AI/ML, Remote*

Oxford Machine Learning Summer School July 2020
Attendee *OxML 2020, Oxford University (Online)*

Recurrent Attentive Neural Process for Sequential Data Dec 2019
Lightning talks *NeurIPS 2019,Learning with Rich Experience (LIRE) Workshop,Vancouver*

Artificial Intelligence for Data Discovery and Reuse (AIDR) 2019 May 2019
Long talk *Carnegie Mellon University, Pittsburgh*

HONORS

· 2022 Qualcomm Innovation Fellowship, North American, 2022
· Apple Scholars in AI/ML PhD fellowship nomination, 1 out of 3 at CMU College of Engineering, 2021
· Certification, Oxford Machine Learning Summer School, 2020 (Online)
· NeurIPS Student Travel Award, NeurIPS , 2019
· Rackham Travel Grant Fellowship, University of Michigan, Ann Arbor, 2018
· Junyuan Scholarship for Undergraduate Student, Fudan University, 2017
· Outstanding Undergraduate Thesis, Fudan University, 2016
· Xiexin Excellent Student Scholarship, Fudan University, 2016
· Junyuan Scholarship for Undergraduate Student, Fudan University, 2016
· 'GuangHua Innovation Prize' of Fudan University, Fudan University, 2015
· China Graduate Future Flight Vehicle Innovation Competition, First Prize, 2014

SELECTED COURSES

Statistical Machine Learning, Probabilistic Graphical Models, Convex Optimization, Reinforcement Learning, Advanced Deep Learning, Intro to Machine Learning, Computer Vision, Machine Learning with Large Datasets, Mobile Robotics: SLAM, Robot Kinematics & Dynamics, Database Management Systems, Data Structures and Algorithms

TECHNICAL AND PERSONAL SKILLS

Computer Languages	Python, JavaScript, C/C++, MATLAB
Softwares & Tools	TensorFlow, Pytorch, ROS, OpenRAVE, MySQL, OpenCV, CUDA, Solidworks, LaTeX
Languages	English, Mandarin, Shanghai Dialect