WENHAO DING

https://github.com/GilgameshD www.wenhao.pub wenhaod@andrew.cmu.edu

EDUCATION

Carnegie Mellon University, Pittsburgh, USA *Aug 2019 - May 2024 (Expected)*
Ph.D. Mechanical Engineering

Carnegie Mellon University, Pittsburgh, USA *Jan 2021 - Dec 2022*
M.S. Machine Leaning

Tsinghua University, Beijing, China *Aug 2014 - July 2018*
B.Eng. Electronic Engineering

RESEARCH INTERESTS

Adversarial Machine Learning: Improving robustness by training against semantic adversarial examples.
Causal Reinforcement Learning: Making generalizable decisions by discovering the underlying causality.
Deep Generative Models: Generating safety-critical scenarios for robust robot development.

HONORS & AWARDS

2022 - Qualcomm Innovation Fellowship Winner, North America
2022 - CMU K&L Gates Presidential Fellowship, College of Engineering nominee
2022 - NeurIPS Scholar Award
2019 - CMU Graduate Student Assembly/Provost Conference Funds
2018 - Tsinghua University Outstanding Undergraduate Thesis Award
2017 - 34th Tsinghua University Academic Challenge Cup (*Second prize*)
2016 - Fellowship of Spark Talents Program (*50 recipients in Tsinghua per year*)

PUBLICATION

Bayesian Reparameterization of Reward-Conditioned Reinforcement Learning with Energy-based Models
***Wenhao Ding**, *Tong Che, Ding Zhao, Marco Pavone*
Under Review, 2023

Generalizing Goal-Conditioned Reinforcement Learning with Variational Causal Reasoning
***Wenhao Ding**, Haohong Lin, Bo Li, Ding Zhao*
Conference on Neural Information Processing Systems (NeurIPS) 2022

SafeBench: A Benchmarking Platform for Safety Evaluation of Autonomous Vehicles
*Chejian Xu, ***Wenhao Ding**, Weijie Lyu, Zuxin Liu, Shuai Wang, Yihan He, Hanjiang Hu, Ding Zhao, Bo Li*
Conference on Neural Information Processing Systems (NeurIPS) 2022

CausalAF: Causal Autoregressive Flow for Goal-Directed Safety-Critical Scenes Generation
***Wenhao Ding**, Haohong Lin, Bo Li, Ding Zhao*
Conference on Robot Learning (CoRL) 2022

Learning to View: Decision Transformers for Active Object Detection
***Wenhao Ding**, Nathalie Majcherczyk, Mohit Deshpande, Xuewei Qi, Ding Zhao, Rajasimman Madhivanan, Arnie Sen*
IEEE International Conference on Robotics and Automation (ICRA) 2023

A Survey on Safety-critical Scenario Generation for Autonomous Driving – A Methodological Perspective
***Wenhao Ding**, Chejian Xu, Haohong Lin, Bo Li, Ding Zhao*
Preprint arXiv:2202.02215

Trustworthy Reinforcement Learning Against Intrinsic Vulnerabilities: Robustness, Safety, and Generalizability
Mengdi Xu, *Zuxin Liu, *Peide Huang, **Wenhao Ding, Zhepeng Cen, Bo Li, Ding Zhao*
Preprint arXiv:2209.08025

Semantically Controllable Scene Generation with Guidance of Explicit Knowledge
***Wenhao Ding**, Bo Li, Kim Ji Eun, Ding Zhao*
Preprint arXiv:2106.04066

Certifiable Deep Importance Sampling for Rare-Event Simulation of Black-Box Systems
*Mansur Arief, Yuanlu Bai, **Wenhao Ding**, Shengyi He, Zhiyuan Huang, Henry Lam, Ding Zhao*
Preprint arXiv:2111.02204

Multimodal Safety-Critical Scenarios Generation for Decision-Making Algorithms Evaluation
***Wenhao Ding**, Baimimng Chen, Bo Li, Kim Ji Eun, Ding Zhao*
IEEE Robotics and Automation Letters (RA-L)

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

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

Deep Probabilistic Accelerated Evaluation: A Certifiable Rare-Event Simulation Methodology for Black-Box Autonomy
Mansur Arief, Zhiyuan Huang*, Guru Kumar, Yuanlu Bai, **Wenhao Ding**, Henry Lam, Ding Zhao*
Artificial Intelligence and Statistics (AISTATS) 2021

Learning to Collide: An Adaptive Safety-Critical Scenarios Generating Method
***Wenhao Ding**, Baiming Chen, Minjun Xu and Ding Zhao*
IEEE International Conference on Intelligent Robots and Systems (IROS) 2020

Adaptive Multi-scale Detection of Acoustic Events
***Wenhao Ding** and Liang He*
IEEE/ACM Transactions on Audio, Speech, and Language Processing (T-ASLP)

CMTS: Conditional Multiple Trajectory Synthesizer for Generating Safety-critical Driving Scenarios
***Wenhao Ding**, Mengdi Xu and Ding Zhao*
IEEE International Conference on Robotics and Automation (ICRA) 2020

A New Multi-vehicle Trajectory Generator to Simulate Vehicle-to-Vehicle Encounters
***Wenhao Ding**, Wenshuo Wang and Ding Zhao*
IEEE International Conference on Robotics and Automation (ICRA) 2019

Prior Knowledge-based Regularization for Sound Event Localization and Detection
Wenhao Ding, Jingyang Zhang* and Liang He*
Detection and Classification of Acoustic Scenes and Events Challenge 2019 (Task 3)

Multi-Scale Time-Frequency Attention for Acoustic Event Detection

Jingyang Zhang, ***Wenhao Ding****, Jintao Kang and Liang He*
Interspeech 2019

MTGAN: Speaker Verification through Multitasking Triplet Generative Adversarial Networks
Wenhao Ding *and Liang He*
Interspeech 2018

Hierarchical Reinforcement Learning Framework towards Multi-agent Navigation
Wenhao Ding*, Shuaijun Li and Huihuan Qian*
IEEE International Conference on Robotics and Biomimetics (ROBIO) 2018

Vehicle Pose and Shape Estimation through Multiple Monocular Vision
Wenhao Ding*, Shuaijun Li, Guilin Zhang, Xiangyu Lei and Huihuan Qian*
IEEE International Conference on Robotics and Biomimetics (ROBIO) 2018

WORK EXPERIENCE

Amazon Lab126, Sunnyvale, CA, USA *May 2022 - Aug 2022*
Applied Scientist Intern

Bosch Center for Artificial Intelligence, Pittsburgh, PA, USA *May 2021 - Aug 2021*
Machine Learning Research Intern

Tsinghua University, Beijing, China *July 2018 - Aug 2019*
Research Engineer

Chinese University of HongKong, HongKong, China *July 2017 - Sep 2017*
Research Assitant

ACADEMIC SERVICES

Conference Reviewer:	ICML 22-23, ICLR 22-23, NeurIPS 21-22 (top reviewer), ECCV 22, CVPR 22-23, ICCV 21-23, ICRA 20-22, IROS 20-22, ICME 20-23
Journal Reviewer:	TMLR, IEEE RA-L, IEEE Access, IEEE T-ITS, IEEE TII, IEEE MM
Organizer:	CVPR 2023 Secure and Safe Autonomous Driving Workshop and Challenge ICRA 2022 SeasonDepth Challenge
Program Committee:	NeurIPS 2022 ML4AD Workshop, NeurIPS 2022 TSRML Workshop, IJCAI 2022 AI4AD Workshop and Challenge

STUDENTS MENTORED

Haohong Lin, *Ph.D. student in CMU*	*Aug 2021 - Now*
Shuai Wang, *Master's student in CMU*	*Aug 2021 - Now*
Guilin Zhang, *Master's student in CMU, now in Google*	*Aug 2021 - May 2022*
Yihan He, *Master's student in CMU, now in DeepRoute*	*Aug 2021 - May 2022*
Jiayi Xia, *Master's student in CMU, now in Zoox*	*Oct 2021 - May 2022*
Minjun Xu, *Master's student in CMU, now in Akuna Capital*	*Oct 2020 - May 2021*
Manoj Bhat, *Master's student in CMU, now in Amazon*	*Oct 2020 - May 2021*

TALKS

Safety-critical Scenarios Generation with Causal Discovery *Oct 26 2022*
Wayve, UK (online)

Safety-Critical Driving Scenario Generation – and What Lessons We Have Learned *Feb 28 2022*
University of Pennsylvania, USA (online), host by Prof. Rahul Mangharam

Safety-critical Scenarios Generation for Autonomous Vehicles *Jan 31 2022*
Stanford University, USA (online), host by Prof. Mykel Kochenderfer