

SINONG(SIMON) ZHAN

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EDUCATION

Northwestern University *Sept 2023 - Now*
PhD in Electrical and Computer Engineering advised by Prof. Qi Zhu
University of California, Berkeley *August 2018 - December 2022*
Bachelor of Art in Computer Science and Applied Mathematics advised by Prof. Sanjit Seshia

TECHNICAL STRENGTHS

Computer Languages	C/C++, Python, Java, R, C#, RISC-V, MATLAB, Julia
Software & Tools	HTML, Excel, Mathematica, Unity3D, Simulink, L ^A T _E X, Autodesk Fusion360
Language	Academic proficiency in Chinese and English, Limited proficiency in German

RESEARCH EXPERIENCE

IDEAS Lab, Northwestern University March 2022-Now
Research Assistant *Advised by Prof. Qi Zhu*

- I'm researching how to provide formal verified aspects (safety or stability guarantee) to the Cyber-Physical Systems. We implemented a framework that jointly conducts learning and formal verification by formulating and solving a bi-level optimization problem, which can cope with deterministic and stochastic continuous systems.

University of California, Berkeley Feb 2022-April 2023
Undergrad Researcher *Advised by Prof. Sanjit Seshia*

- I'm working on LOGiCS Project, the STR pipeline. We design a set of automated design-optimization, simulation, control/path planning, SMT-based 3D bin packing problem solver, and verification tool-chain on various robots' designs.

Human Computing Lab, ISCAS and XDiscovery Lab, Dartmouth May 2019-Sep 2021
Research Assistant *Advised by Prof. Feng Tian & Prof. Teng Han & Prof. Xingdong Yang*

- I have researched the new fabrication and novel interaction techniques under the HCI context. Specifically, I have worked on developing novel input and feedback devices, using fast prototyping techniques, in the VR environment.

WORK EXPERIENCE

CAS Ruiyi Technology Co., Ltd May 2020-Aug 2021
Software Developer

- Collected and Analyzed patients' and health people's performance data for product robustness testing.
- Participated in developing WeChat programs for both doctor and patient sides on test analysis.
- Pitched and Conducted live demos to various clients including top-tier hospitals and investors.

PUBLICATION(* STANDS FOR EQUAL CONTRIBUTION)

Model-Based Reward Shaping for Adversarial Inverse Reinforcement Learning in Stochastic Environments. Simon Sinong Zhan, Qingyuan Wu, Philip Wang, Yixuan Wang, Ruochen Jiao, Chao Huang, Qi Zhu. *In Submission*. link: <https://arxiv.org/pdf/2410.03847>

Variational Delayed Policy Optimization. Qingyuan Wu*, Simon Sinong Zhan*, Yixuan Wang, Yuhui Wang, Chung-Wei Lin, Chen Lv, Qi Zhu, Chao Huang. *The Conference on Neural Information Processing Systems 2024 (Spotlight)*. link: <https://arxiv.org/abs/2405.14226>

Switching Controller Synthesis for Hybrid Systems Against STL Formulas. Han Su, Shenghua Feng, Simon Sinong Zhan, Naijun Zhan. *The 26th International Symposium on Formal Methods*. link: https://link.springer.com/chapter/10.1007/978-3-031-71177-0_15

Case Study: Runtime Safety Verification of Neural Network Controlled System. Frank Yang, Simon Sinong Zhan, Yixuan Wang, Chao Huang, Qi Zhu. *The 24th International Conference on Runtime Verification*. link: https://link.springer.com/chapter/10.1007/978-3-031-74234-7_13

State-wise safe reinforcement learning with pixel observations. Simon Sinong Zhan, Yixuan Wang, Qingyuan Wu, Ruochen Jiao, Chao Huang, Qi Zhu. *6th Annual Learning for Dynamics Control Conference*. link: <https://proceedings.mlr.press/v242/zhan24a.html>

Boosting Reinforcement Learning with Strongly Delayed Feedback Through Auxiliary Short Delays. Qingyuan Wu, Simon Sinong Zhan, Yixuan Wang, Yuhui Wang, Chung-Wei Lin, Chen Lv, Qi Zhu, Jurgen Schmidhuber, Chao Huang. *Forty-first International Conference on Machine Learning*. link: <https://openreview.net/forum?id=0IDaPnY5d5>

Empowering autonomous driving with large language models: A safety perspective. Yixuan Wang, Ruochen Jiao, Chengtian Lang, Simon Sinong Zhan, Chao Huang, Zhaoran Wang, Zhuoran Yang, Qi Zhu. *LLMagent@ICLR 2024*. link: <https://arxiv.org/abs/2312.00812>

Kinematics-aware Trajectory Generation and Prediction with Latent Stochastic Differential Modeling. Ruochen Jiao*, Yixuan Wang*, Xiangguo Liu, Simon Sinong Zhan, Chao Huang, Qi Zhu. *IEEE/RSJ International Conference on Intelligent Robots and Systems 2023*. link: <https://arxiv.org/abs/2309.09317>

Enforcing Hard Constraints with Soft Barriers: Safe Reinforcement Learning in Unknown Stochastic Environments. Yixuan Wang, Simon Sinong Zhan, Ruochen Jiao, Zhilu Wang, Wanxin Jin, Zhuoran Yang, Zhaoran Wang, Chao Huang, Qi Zhu. *The International Conference on Machine Learning 2023*. link: <https://arxiv.org/abs/2209.15090>

Joint Differentiable Optimization and Verification for Certified Reinforcement Learning. Yixuan Wang*, Simon Sinong Zhan*, Zhilu Wang, Chao Huang, Zhaoran Wang, Zhuoran Yang, Qi Zhu. *14th International Conference on Cyber-Physical Systems (with CPS-IoT Week 2023)*. link: <https://arxiv.org/abs/2201.12243>

MicroFluID - A Reconfigurable RFID Platform for Robust Interaction Sensing Based on Microfluidics. Wei Sun, Yuwen Chen, Yanjun Chen, Simon Sinong Zhan, Yixin Li, Jiecheng Wu, Teng Han, Feng Tian, Jingxian Wang, Haipeng Mi, Xing-Dong Yang. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies 2022*. link: <https://dl.acm.org/doi/abs/10.1145/3550296>

RElectrode: A Reconfigurable Electrode For Multi-Purpose Sensing Based on Microfluidics. Wei Sun, Yanjun Chen, Simon Sinong Zhan, Teng Han, Feng Tian, Hongan Wang, Xing-Dong Yang. *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*. link: <https://doi.org/10.1145/3411764.3445652>

No.CN201710953534.X **The Device generating control instruction for multi-targets based on EMG(electromyography) signal** Simon Zhan, Junjun Fan, Feng Tian, Wei Sun. *Protected by Patent Law of the People's Republic of China*

No.CN202110377915.4 **A complex microfluidic pipeline composite structure and microfluidic pattern deformation system based on microfluidic technology** Wei Sun, Yanjun Chen, Simon Zhan, Teng Han, Feng Tian, Hongan Wang, Xing-Dong Yang. *Protected by Patent Law of the People's Republic of China*

No.CN202110378536.7 **A fluid pattern re-configurable system based on microfluidic technology** Wei Sun, Yanjun Chen, Simon Zhan, Teng Han, Feng Tian, Hongan Wang, Xing-Dong Yang. *Protected by Patent Law of the People's Republic of China*