Yanan Sui

TENURED *Associate Professor*
Tsinghua University
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RESEARCH APPOINTMENTS

Associate Professor 2021 - now
Tsinghua University
Institute of Human-Machine-Environment Engineering, School of Aerospace Engineering

Assistant Professor 2019 - 2021
Tsinghua University
Institute of Human-Machine-Environment Engineering, School of Aerospace Engineering

Postdoctoral Researcher 2018 - 2019
Stanford University
Supervisor: Prof. Fei-Fei Li
Research Topic: machine learning, computer vision, applications in medicine and robotics

Postdoctoral Researcher 2016 - 2018
California Institute of Technology
Supervisors: Prof. Joel Burdick, Prof. Yisong Yue
Research Topic: machine learning theory and algorithms, applications in neural engineering and robotics

Research Assistant 2010 - 2011
Institute of Neuroscience, Chinese Academy of Sciences
Supervisors: Prof. Mu-ming Poo
Research Topic: computation and experimental methods for investigating neural plasticity

EDUCATION

Ph.D. Computation and Neural Systems 2011 - 2016
California Institute of Technology
Minor in **Applied and Computational Mathematics**
Research Committee: Joel Burdick (Supervisor), Richard Murray, Pietro Perona, Yisong Yue

B.E. Biomedical Engineering 2006 - 2010
Tsinghua University

RESEARCH AREAS

Machine Learning, Neural Engineering, Optimization and Control, Robotics

ACADEMIC SERVICE

Senior Area Chair
International Conference on Learning Representations (ICLR)

Area Chair
International Conference on Artificial Intelligence and Statistics (AISTATS)
Conference on Robot Learning (CoRL)
International Conference on Machine Learning (ICML)
Machine Learning for Health (ML4H)
Neural Information Processing Systems (NeurIPS)

Organizing Committee
Program Chair : Deep Brain Stimulation Initiative Workshop (2018)
Workshop Chair : International Conference on Learning Representations (ICLR 2025)
Senior Workshop Chair : International Conference on Learning Representations (ICLR 2026)

AWARDS

AI 100 Young Pioneer Award 2025
MIT Technology Review China and DeepTech
ICRA How Do Robots Care Workshop Best Paper Award 2025
How Do Robots Care Workshop, International Conference on Robotics and Automation
MIT Technology Review Innovators Under 35 (China) 2020
MIT Technology Review
ICRA Best Conference Paper Award 2020
International Conference on Robotics and Automation
ICRA Best Paper Award on Human-Robot Interaction 2020
International Conference on Robotics and Automation

STUDENT AWARDS

ShuiMu Scholar Fellowship 2025
to PhD student Yunyue Wei by Tsinghua
The Hertz Fellowship 2025
to former Caltech SURF student Cloris Cheng by Hertz Foundation
Best Student Team Award 2024
to PhD students Chenhui Zuo et al. by MyoChallenge @ NeurIPS 2024
XingHua Scholar Fellowship 2024
to former Caltech SURF and current Tsinghua PhD student Saraswati Soedarmadji by Tsinghua

TEACHING AND MENTORSHIP

Instructor 2023 - now
Fundamentals of Computer Programming and Artificial Intelligence (Tsinghua University)
Instructor 2020 - now
Human Factors and Artificial Intelligence (Tsinghua University)
Instructor 2019 - now
AI for Health Innovation and Entrepreneurship (Tsinghua University)
Co-Instructor 2018 - 2019
AI-Assisted Health Care (Stanford University)
Mentoring Graduate Research Projects 2018 - 2023
Computer Science (Stanford University)

Mentoring Undergrad and Graduate Research Projects 2015 - now
Computation and Mathematical Sciences (California Institute of Technology)

PUBLICATIONS

[1] Dong Wang, Liang She, **Sui, Yanan**, Xiao-bing Yuan, Yunqing Wen, and Mu-ming Poo. Forward transport of proteins in the plasma membrane of migrating cerebellar granule cells. *Proceedings of the National Academy of Sciences*, 109(51):E3558–E3567, 2012.

[2] Jing Zhou, Yunqing Wen, Liang She, **Sui, Yanan**, Lu Liu, Linda J Richards, and Mu-ming Poo. Axon position within the corpus callosum determines contralateral cortical projection. *Proceedings of the National Academy of Sciences*, 110(29):E2714–E2723, 2013.

[3] Feng Wang, Li Zuo, Bo Hong, Dongyi Han, Ethan M Range, Lingyun Zhao, **Sui, Yanan**, Weiwei Guo, and Liangfa Liu. Tonotopic reorganization and spontaneous firing in inferior colliculus during both short and long recovery periods after noise overexposure. *Journal of Biomedical Science*, 20(1):91, 2013.

[4] **Sui, Yanan** and Joel W. Burdick. Clinical online recommendation with subgroup rank feedback. In *ACM Conference on Recommender Systems (RecSys)*, 2014.

[5] **Sui, Yanan**, Alkis Gotovos, Joel W. Burdick, and Andreas Krause. Safe exploration for optimization with gaussian processes. In *International Conference on Machine Learning (ICML)*, 2015.

[6] **Sui, Yanan**, Vincent Zhuang, Joel w. Burdick, and Yisong Yue. Multi-dueling bandits with dependent arms. In *Conference on Uncertainty in Artificial Intelligence (UAI)*, 2017.

[7] **Sui, Yanan**, Yisong Yue, and Joel W. Burdick. Correlational dueling bandits with application to clinical treatment in large decision spaces. In *International Joint Conference on Artificial Intelligence (IJCAI)*, 2017.

[8] **Sui, Yanan**, Kun ho Kim, and Joel W. Burdick. Quantifying performance of bipedal standing with multi-channel emg. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2017.

[9] Akifumi Wachi, **Sui, Yanan**, Yisong Yue, and Masahiro Ono. Safe exploration and optimization of constrained mdps using gaussian processes. In *AAAI Conference on Artificial Intelligence (AAAI)*, 2018.

[10] **Sui, Yanan**, Vincent Zhuang, Joel W. Burdick, and Yisong Yue. Stagewise safe bayesian optimization with gaussian processes. In *International Conference on Machine Learning (ICML)*, 2018.

[11] **Sui, Yanan**, Masrour Zoghi, Katja Hofmann, and Yisong Yue. Advancements in dueling bandits. In *International Joint Conference on Artificial Intelligence (IJCAI)*, 2018.

[12] Richard Cheng, **Sui, Yanan**, Dimitry Sayenko, and Joel W. Burdick. On muscle activation for improving robotic rehabilitation after spinal cord injury. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2018.

[13] Yue Chen, Chen Gong, Hongwei Hao, Yi Guo, Shujun Xu, Guoping Yin, Xin Cao, Yuhuan Zhang, Jingying Ye, Hesheng Liu, Jianguo Zhang, **Sui, Yanan***, and Luming Li*. Automatic sleep stage classification based on subthalamic local field potentials. *IEEE Trans on Neural Systems and Rehabilitation Engineering*, (* corresponding authors), 2019.

[14] Chien-Yi Chang, De-An Huang, **Sui, Yanan**, Li Fei-Fei, and Juan Carlos Niebles. D^{3}tw: Discriminative differentiable dynamic time warping for weakly supervised action alignment and segmentation. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2019.

[15] Richard Cheng, **Sui, Yanan**, Dimitry Sayenko, and Joel W. Burdick. Motor control after human sci through activation of muscle synergies under spinal cord stimulation. *IEEE Trans on Neural Systems and Rehabilitation Engineering*, 2019.

[16] Bingquan Zhu, Hao Fang, **Sui, Yanan**, and Luming Li. Learning the critical features for paraplegic standing via epidural stimulation. *AAAI/ACM Conference on Artificial Intelligence, Ethics, and Society (AIES)*, 2020. **Reported by *Science*** (DOI: 10.1126/science.370.6517.731).

[17] Maegan Tucker, Ellen Novoseller, Claudia Kann, **Sui, Yanan**, Yisong Yue, Joel W. Burdick, and Aaron D. Ames. Preference-based learning for exoskeleton gait optimization. *International Conference on Robotics and Automation (ICRA)*, 2020. **Best Conference Paper Award & Best Paper Award on Human-Robot Interaction**.

[18] Ellen Novoseller, Yibing Wei, **Sui, Yanan**, Joel W. Burdick, and Yisong Yue. Dueling posterior sampling for preference-based reinforcement learning. In *Conference on Uncertainty in Artificial Intelligence (UAI)*, 2020.

[19] Akifumi Wachi and **Sui, Yanan**. Safe reinforcement learning in constrained markov decision processes. In *International Conference on Machine Learning (ICML)*, 2020.

[20] Yue Chen, **Sui, Yanan**, Chen Gong, Bozhi Ma, Hongwei Hao, and Luming Li. Chronically monitoring the deep brain rhythms: latest clinical progress. *Science Bulletin*, 65(12):965–967, 2020.

[21] Hao Fang, Chen Gong, Chen Zhang, **Sui, Yanan**, and Luming Li. Parkinsonian chinese speech analysis towards automatic classification of parkinson's disease. In *Machine Learning for Health (ML4H)*, 2020.

[22] **Sui, Yanan**, Ye Tian, Wai Kin Daniel Ko, Zhiyan Wang, Fumin Jia, Andreas Horn, Dirk De Ridder, Ki Sueng Choi, Ausaf A Bari, Shouyan Wang, et al. Deep brain stimulation initiative: toward innovative technology, new disease indications, and approaches to current and future clinical challenges in neuromodulation therapy. *Frontiers in Neurology*, 11, 2021.

[23] Kejun Li, Maegan Tucker, Erdem Bıyık, Ellen Novoseller, Joel W Burdick, **Sui, Yanan**, Dorsa Sadigh, Yisong Yue, and Aaron D Ames. Roial: Region of interest active learning for characterizing exoskeleton gait preference landscapes. *International Conference on Robotics and Automation (ICRA)*, 2021.

[24] Vincent Zhuang and **Sui, Yanan**. No-regret reinforcement learning with heavy-tailed rewards. In *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2021.

[25] Yunyue Wei, Bingquan Zhu, Chen Hou, Chen Zhang, and **Sui, Yanan**. Interactive video acquisition and learning system for motor assessment of parkinson's disease. In *International Joint Conference on Artificial Intelligence (IJCAI)*, 2021.

[26] Kuno Kim, Akshat Jindal, Yang Song, Jiaming Song, **Sui, Yanan**, and Stefano Ermon. Imitation with neural density models. *Advances in Neural Information Processing Systems (NeurIPS)*, 2021.

[27] Songyuan Zhang, Zhangjie Cao, Dorsa Sadigh, and **Sui, Yanan**. Confidence-aware imitation learning from demonstrations with varying optimality. *Advances in Neural Information Processing Systems (NeurIPS)*, 2021.

[28] Akifumi Wachi, Yunyue Wei, and **Sui, Yanan**. Safe policy optimization with local generalized linear function approximations. *Advances in Neural Information Processing Systems (NeurIPS)*, 2021.

[29] **Sui, Yanan**, Huiling Yu, Chen Zhang, Yue Chen, Changqing Jiang, and Luming Li. Deep brain–machine interfaces: sensing and modulating the human deep brain. *National Science Review*, 9(10), 2022.

[30] Chen Gong, Yue Chen, **Sui, Yanan**, and Luming Li. Automatic sleep stage classification with cross-modal self-supervised features from deep brain signals. In *2023 11th International IEEE/EMBS Conference on Neural Engineering (NER)*, pages 1–4. IEEE, 2023.

[31] Chenhui Zuo, Kaibo He, Jing Shao, and **Sui, Yanan**. Self model for embodied intelligence: Modeling full-body human musculoskeletal system and locomotion control with hierarchical low-dimensional representation. In *2024 IEEE International Conference on Robotics and Automation (ICRA)*, pages 13062–13069. IEEE, 2024.

[32] Zhengfei Zhang, Yunyue Wei, and **Sui, Yanan**. An invariant information geometric method for high-dimensional online optimization. *Learning for Dynamics Control Conference (L4DC)*, 2024.

[33] Zeji Yi, Yunyue Wei, Chu Xin Cheng, Kaibo He, and **Sui, Yanan**. Improving sample efficiency of high dimensional bayesian optimization with mcmc. *Learning for Dynamics Control Conference (L4DC)*, 2024.

[34] Akifumi Wachi, Xun Shen, and **Sui, Yanan**. A survey of constraint formulations in safe reinforcement learning. *International Joint Conference on Artificial Intelligence (IJCAI)*, 2024.

[35] Zhengfei Zhang, Kishan Panaganti, Laixi Shi, **Sui, Yanan**, Adam Wierman, and Yisong Yue. Distributionally robust constrained reinforcement learning under strong duality. *Reinforcement Learning Conference (RLC)*, 2024.

[36] Kaibo He, Chenhui Zuo, Chengtian Ma, and **Sui, Yanan**. Dynsyn: Dynamical synergistic representation for efficient learning and control in overactuated embodied systems. *International Conference on Machine Learning (ICML)*, 2024.

[37] Bingquan Zhu, Chen Zhang, **Sui, Yanan**, and Luming Li. Facemotionpreserve: a generative approach for facial de-identification and medical information preservation. *Scientific Reports*, 14(1):17275, 2024.

[38] Yunyue Wei, Zeji Yi, Hongda Li, Saraswati Soedarmadji, and **Sui, Yanan**. Safe bayesian optimization for the control of high-dimensional embodied systems. In *Annual Conference on Robot Learning (CoRL)*, 2024.

[39] Yunyue Wei, Vincent Zhuang, Saraswati Soedarmadji, and **Sui, Yanan**. Scalable bayesian optimization via focalized sparse gaussian processes. In *Neural Information Processing Systems (NeurIPS)*, 2024.

[40] Yunyue Wei, Shanning Zhuang, Vincent Zhuang, and **Sui, Yanan**. Motion control of high-dimensional musculoskeletal systems with hierarchical model-based planning. In *International Conference on Learning Representations (ICLR)*, 2025.

[41] Haixin Gong, Chen Zhang, and **Sui, Yanan**. Contact-rich and deformable foot modeling for locomotion control of the human musculoskeletal system. In *International Conference on Humanoid Robots (Humanoids)*, 2025.

[42] Chengtian Ma, Yunyue Wei, Chenhui Zuo, Chen Zhang, and **Sui, Yanan**. Bipedal balance control with whole-body musculoskeletal standing and falling simulations. In *Annual Conference on Robot Learning (CoRL)*, 2025.