Lifeng Fan

CONTACT INFORMATION

Beijing Institute for
General Artificial Intelligence
Beijing, China

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EDUCATION

University of California, Los Angeles, CA, USA 09/2016 - 06/2021
Ph.D. Candidate in Statistics
GPA:3.967/4.00

Zhejiang University, Hangzhou, China 09/2012 - 06/2016
B.S. in Statistics, Minor in Public Management
GPA: 3.98/4.00

RESEARCH EXPERIENCE

Beijing Institute for General Artificial Intelligence, China 07/2021 - present
Research Scientist
- Computational modeling of Theory of Mind in social interaction.
- Computational modeling of human communication mechanism.
- AI assists humans in daily tasks.
- Context and commonsense reasoning for intent understanding.
- Video generation via concept learning and logic composition.
- Video Captioning based on understanding of mental states.

Facebook Reality Lab, USA 06/2020 - 11/2020
Research Intern *Mentor: Tanya Jonker*
- Egocentric action anticipation via multi-scale graph representation.

DMAI Inc., Los Angeles, CA, USA 06/2019 - 03/2020
Software Engineering Intern *Mentor: Tao Yuan*
- Cognitive Platform: detecting human body pose, head pose and pointing gesture; detecting human interaction and communication; modeling human mind, including belief, attention and intention

Center for Vision, Cognition, Learning and Autonomy, UCLA 09/2016 - 06/2021
Graduate Student Researcher *Advisor: Song-Chun Zhu*
- Cooperation and Communication Mechanisms: the emergence of communicative cooperation in a problem-solving task.
- Theory of Mind: human mental state inference in VR environment and real videos
- Understanding human nonverbal communication by spatio-temporal reasoning networks
- Social Scene Understanding: inferring shared attention in social scene videos
- Cognitive Modeling: perception of human interaction based on motion trajectories

The Computational Vision and Learning Lab, UCLA 07/2015 - 09/2015
Cross-Disciplinary Scholars in Science and Technology (CSST) Program *Advisor: Hongjing Lu*
- Discovering hierarchical representations for action recognition
- Honored with Best Presentation Award for excellent research and final presentation

State Key Lab of CAD, ZJU 06/2014 - 06/2016
Research Assistant *Advisor: Ming Li*
- Texture synthesis optimization by Expectation Maximization algorithm

PUBLICATIONS (* indicates equal contribution)

J. Wang*, C. Zhang*, J. Li, Y. Ma, L. Niu, J. Han, Y. Peng, Y. Zhu, **L. Fan**. A Deep Evaluation of Human and GPT's Social Intelligence based on a Unified Theoretical Framework of Social Dynamics. *CogSci 2024, under review.*

L. Niu, F. Zhong, H. Zhao, Y. Wang, X. Feng, **L. Fan**. Queen or Dwarf? Theory of Mind Matters in Communication-dependent and Hidden-Desire Environments. *CVPR 2024, under review.*

Z. Cao*, Z. Wang*, S. Xie, A. Liu, **L. Fan**. Smart Help: Strategic Opponent Modeling for Proactive and Adaptive Robot Assistance in Households. *CVPR 2024, under review.*

Y. Qian, P. Yu, Y. Wu, W. Wang, **L. Fan**. Learning Concept-Based Causal Transitions for Visual Planning. *Arxiv Preprint, under review.*

L. Fan, S. Qiu, C. Zhang, T. Gao, Z. Zheng, Y. Zhu, S.-C. Zhu. Five Mind: Triadic Belief Dynamics Inference in Social Events Benefits Deep Video Understanding. *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2023, under review.*

Y. Peng, J. Han, Z. Zhang, **L. Fan**, T. Liu, S. Qi, X. Feng, Y. Ma, Y. Wang, S.-C. Zhu. TONG-test: Evaluating Artificial General Intelligence Through Dynamic Embodied Physical and Social Interactions. *Engineering 2023.*

J. Li, P. Wei, W. Han, **L. Fan**. IntentQA: Context-aware Video Intent Reasoning. *IEEE International Conference on Computer Vision (ICCV), 2023.* (Oral presentation)

L. Fan, M. Xu, Z. Cao, Y. Zhu, S.-C. Zhu. Artificial Social Intelligence: A Comparative and Holistic Perspective. *CAAI Artificial Intelligence Research, 2022.*

S. Qiu*, S. Xie*, **L. Fan**, T. Gao, S.-C. Zhu, Y. Zhu. Emergent Graphical Conventions in a Multi-agent Visual Communication Game. *NeuRIPS, 2022.*

Z. Zheng, S. Qiu, **L. Fan**, Y. Zhu, S.-C. Zhu. Grice: A Grammar-based Dataset for Recovering Implicature and Conversational Reasoning. *ACL-IJCNLP Findings, 2021.*

L. Fan*, S. Qiu*, Z. Zheng, T. Gao, S.-C. Zhu and Y. Zhu. Learning Triadic Belief Dynamics in Nonverbal Communication from Videos. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2021.* (Oral presentation)

Y. Zhu, T. Gao, **L. Fan**, S. Huang, M. Edmonds, H. Liu, F. Gao, C. Zhang, S. Qi, Y. Wu, J. B. Tenenbaum, S.-C. Zhu. Dark, Beyond Deep: A Paradigm Shift to Cognitive AI with Human-like Commonsense. *Engineering, Special Issue on Artificial Intelligence, 2020.*

T. Yuan, H. Liu, **L. Fan**, Z. Zheng, T. Gao, Y, Zhu, S.-C. Zhu. Understanding False-Belief by Joint Inference of Object States, Robot Knowledge, and Human Beliefs. *IEEE International Conference on Robotics and Automation (ICRA), 2020.*

L. Fan*, W. Wang*, S. Huang, X. Tang and S.-C. Zhu. Understanding Human Gaze Communication by Spatio-temporal Graph Reasoning. *IEEE International Conference on Computer Vision (ICCV), 2019.*

L. Fan*, Y. Chen*, P. Wei, W. Wang and S.-C. Zhu. Inferring Shared Attention in Social

Scene Videos. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2018.* (Acceptance Rate: 29%)

T. Shu*, Y. Peng*, **L. Fan**, H. Lu and S.-C. Zhu. Perception of Human Interaction Based on Motion Trajectories: from Aerial Videos to Decontextualized Animations. *Topics in Cognitive Science (TopiCS), 10(1): 225 - 241, 2018.*

T. Shu*, Y. Peng*, **L. Fan**, H. Lu and S.-C. Zhu. Inferring Human Interaction from Motion Trajectories in Aerial Videos. *39th Annual Meeting of the Cognitive Science Society (CogSci), 2017.* (Oral presentation, Acceptance rate: 255/873 = 29%, Computational Modeling Prize)

Selected Hornors And Awards

Most Promising Computational Statistician, UCLA Statistics Department	06/2017
Computational Modeling Prize, Cognitive Science Society	06/2017
The 6th Ten Top Students in Zhejiang University, Zhejiang University	12/2015
Chu Kochen Scholarship, Zhejiang University	10/2015
Best Presentation Award, UCLA-CSST Summer Research Program	09/2015
Honorable Mention, Mathematical Contest in Modeling (MCM)	04/2015
Tang Lixin Scholarship, Zhejiang University	10/2014 - present
First Prize in the 12th Mathematical Modeling Contest of Zhejiang University	06/2014
National Scholarship of China, Ministry of Education, China	2013, 2014

Teaching Experience

Teaching Assistant, UCLA, Department of Statistics

STATS 202A: Statistics Programming	Fall 2017
STATS 10: Introduction to Statistical Reasoning	Spring 2017
STATS 102C: Introduction to Monte Carlo Methods	Fall 2018
STATS 12: Intro to Statistical Methods for Geography and Environmental Studies	Winter 2018
STATS 100A: Introduction to Probability	Winter 2019
STATS 232C: Cognitive Artificial Intelligence	Spring 2020
STATS 100B: Introduction to Mathematical Statistics	Winter 2021
STATS 101A: Introduction to Data Analysis and Regression	Spring 2021

Programming Languages

C/C++, C#, Python, MATLAB, R, LaTeX, HTML

Deep Learning Frameworks

Pytorch, Tensorflow, Keras