Alan Z. Luo

PhD Student
Stanford Vision and Learning (SVL) Lab
Computer Science Department, Stanford University

Email: alanzluo@stanford.edu
[Website] [Google Scholar]

Education

2018-present   **Stanford University**, Doctor of Philosophy in Computer Science
Advisor: Fei-Fei Li, GPA: 3.99/4.00

2015-2018   **Stanford University**, Master of Science in Computer Science
Specialization in Artificial Intelligence
Advisor: Fei-Fei Li, GPA: 3.99/4.00

2012-2015   **University of Illinois Urbana-Champaign**, Bachelor of Science in Computer Engineering
Minor in Mathematics
Advisors: Gabriel Popescu, Narendra Ahuja, Jia-Bin Huang, GPA: 3.94/4.00

Research Interests

Computer Vision: video understanding, video-language models, activity recognition

Machine Learning: self-supervised learning, transfer learning, compositional generalization, multimodal learning, differential privacy

Work Experience

2021   **Nvidia Machine Learning**, Research Intern
Proposed a paradigm for training differentially-private models that could be scaled to large-scale vision tasks.

2019   **Facebook Research**, Research Intern
Developed a self-supervised learning model for reconstructing 3D objects from videos.

2017   **Google Cloud AI**, Research Intern
Proposed a method for detecting and classifying human activities in multimodal videos based on the knowledge distillation of privileged information.

2016   **Amazon A9**, Research Intern
Designed and implemented an RNN-based optical character recognition (OCR) system.

2015   **Yahoo**, Software Engineering Intern
Developed and extended web applications and user interfaces for the Yahoo homepage using React.

Publications

Conference Publications

[1]   MOMA-LRG: Language-Refined Graphs for Multi-Object Multi-Actor Activity Parsing
Z. Luo, Z. Durante*, L. Li*, W. Xie, R. Liu, E. Jin, Z. Huang, L.Y. Li, J. Wu, J.C. Niebles, E. Adeli, and L. Fei-Fei. *Track on Datasets and Benchmarks, Conference on Neural Information Processing Systems (NeurIPS).* 2022.

[2]   MOMA: Multi-Object Multi-Actor Activity Parsing
Z. Luo*, W. Xie*, S. Kapoor, Y. Liang, M. Cooper, J.C. Niebles, E. Adeli, and L. Fei-Fei. *Conference on Neural Information Processing Systems (NeurIPS).* 2021.

[3]   Scalable Differential Privacy with Sparse Network Fine-Tuning
Z. Luo*, D. Wu, E. Adeli, and L. Fei-Fei. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR).* 2021.

[4]   Graph Distillation for Action Detection with Privileged Information
Z. Luo*, J.-T. Hsieh, L. Jiang, J.C. Niebles, and L. Fei-Fei. *European Conference on Computer Vision (ECCV).* 2018.

[5]   DF-Net: Unsupervised Joint Learning of Depth and Flow using Cross-Network Consistency
Y. Zou, Z. Luo, and J.-B. Huang. *European Conference on Computer Vision (ECCV).* 2018.

[6]   Computer Vision-Based Descriptive Analytics of Seniors' Daily Activities for Long-Term Health Monitoring
Z. Luo*, J.-T. Hsieh*, N. Balachandar, S. Yeung, G. Pusiol, J. Luxenberg, G. Li, L.-J. Li, N.L. Downing, A. Milstein, and L. Fei-Fei. *Machine Learning for Healthcare (MLHC).* 2018.

[7]   Label Efficient Learning of Transferable Representations across Domains and Tasks
Z. Luo, Y. Zou, J. Hoffman, and L. Fei-Fei. *Neural Information Processing Systems (NeurIPS).* 2017.

[8]   Unsupervised Learning of Long-Term Motion Dynamics for Videos
Z. Luo, B. Peng, A. Alahi, D.-A. Huang, and L. Fei-Fei. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR).* 2017.

[9]   Towards Vision-Based Smart Hospitals: A System for Tracking and Monitoring Hand Hygiene Compliance
A. Haque, M. Guo, A. Alahi, S. Yeung, Z. Luo, A. Rege, A. Singh, J. Jopling, N.L. Downing, W. Beninati, T. Platchek, A. Milstein, and L. Fei-Fei. *Machine Learning for Healthcare (MLHC).* 2017.

[10]   Computer Vision-based Approach to Maintain Independent Living for Seniors
Z. Luo, A. Rege, G. Pusiol, A. Milstein, L. Fei-Fei, and N.L. Downing. *American Medical Informatics Association (AMIA) Annual Symposium.* 2017.

[11]   Towards Viewpoint Invariant 3D Human Pose Estimation
A. Haque, Z. Luo*, B. Peng*, A. Alahi, S. Yeung, and L. Fei-Fei. *European Conference on Computer Vision (ECCV).* 2016.

[12]   Vision-Based Hand Hygiene Monitoring in Hospitals
S. Yeung, A. Alahi, A. Haque, B. Peng, Z. Luo, A. Singh, T. Platchek, A. Milstein, and L. Fei-Fei. *American Medical Informatics Association (AMIA) Annual Symposium.* 2016.

[13]   High Throughput Imaging of Blood Smears using White Light Diffraction Phase Microscopy
H. Majeed, M. Kandel, B. Bhadhuri, K. Han, Z. Luo, K. Tangella, and G. Popescu. *SPIE Quantitative Phase Imaging* (Vol. 9336, pp. 201-205). 2015.

[14]   Diagnosis of Breast Cancer Biopsies using Quantitative Phase Imaging
H. Majeed, M. Kandel, K. Han, Z. Luo, V. Macias, K. Tangella, A. Balla, and G. Popescu. *SPIE Quantitative Phase Imaging* (Vol. 9336, pp. 170-175). 2015.

[15]   C++ Software Integration for a High-throughput Phase Imaging Platform
M. Kandel, Z. Luo, K. Han, and G. Popescu. *SPIE Quantitative Phase Imaging* (Vol. 9336, pp. 91-98). 2015.

Journal Publications

[16] Harnessing the Power of Smart and Connected Health to Tackle COVID-19: IoT, AI, Robotics, and Blockchain for a Better World
F. Firouzi, B. Farahani, M. Daneshmand, K. Grise, J.S. Song, R. Saracco, L. Lu Wang, K. Lo, P. Angelov, E. Soares, P.-S. Loh, Z. Talebpour, R. Moradi, M. Goodarzi, H. Ashraf, M. Talebpour, A. Talebpour, L. Romeo, R. Das, H. Heidari, D. Pasquale, J. Moody, C. Woods, E.S. Huang, P. Barnaghi, M. Sarrafzadeh, R. Li, K.L. Beck, O. Isayev, N. Sung, and A. Luo. *IEEE Internet of Things Journal*, 8(16), 12826-12846. 2021.

[17] Ethical Issues in Using Ambient Intelligence in Health-Care Settings
N. Martinez-Martin, Z. Luo, A. Kaushal, E. Adeli, A. Haque, S.S. Kelly, S. Wieten, M.K. Cho, D. Magnus, L. Fei-Fei, K. Schulman, and A. Milstein. *The Lancet Digital Health*, 3(2), e115-e123. 2021.

[18] Label-Free Tissue Scanner for Colorectal Cancer Screening
M.E. Kandel, S. Sridharan, J. Liang , Z. Luo, K. Han, M. Virgilia, A. Shah, R. Patel, K. Tangella, A. Kajdacsy-Balla, G. Guzman, and G. Popescu. *Journal of biomedical optics*, 22(6), 066016. 2017.

[19] Breast Cancer Diagnosis using Spatial Light Interference Microscopy
H. Majeed, M. Kandel, K. Han, Z. Luo, V. Macias, K. Tangella, A. Balla, and G. Popescu. *Journal of biomedical optics*, 20(11), 111210-111210. 2015.

Workshop Publications

[20] Vision-Based Gait Analysis for Senior Care
E. Darke, A. Sayana, K. Shen, D. Xue, J.-T. Hsieh, Z. Luo, L.-J. Li, N.L. Downing, A. Milstein, and L. Fei-Fei. *Workshop on Machine Learning in Healthcare, Neural Information Processing Systems (NeurIPS)*, 2018.

[21] Vision-Based Hand Hygiene Monitoring in Hospitals
S. Yeung, A. Alahi, Z. Luo, B. Peng, A. Haque, A. Singh, T. Platchek, A. Milstein, and L. Fei-Fei. *Workshop on Machine Learning in Healthcare, Neural Information Processing Systems (NeurIPS)*, 2015.

Teaching

Fall 2021	Instructor, AI-Assisted Health Care (CS337/MED277), Stanford University
Winter 2019	Head Course Assistant, AI-Assisted Health Care (CS337/MED277), Stanford University
Fall 2018	Head Course Assistant, AI-Assisted Health Care (CS337/MED277), Stanford University
Spring 2017	Course Assistant, Convolutional Neural Networks (CS231N), Stanford University
Winter 2017	Course Assistant, Natural Language Processing (CS224N), Stanford University
Fall 2016	Head Course Assistant, Computer Vision (CS131), Stanford University
Spring 2016	Course Assistant, Probability (CS109), Stanford University
Winter 2016	Course Assistant, Probability (CS109), Stanford University
Fall 2015	Head Course Assistant, Computer Vision (CS131), Stanford University

Large-Scale Projects

2015-present **ICU Clinical Pathway Support**, Project Lead, Partnership in AI-Assisted Care, Stanford University
Developing the Clinical Behavior Atlas, a new and high-throughput framework for understanding of clinical care delivery with vision-based ambient intelligence.

2016-present **AI-Assisted Senior Care**, Project Lead, Partnership in AI-Assisted Care, Stanford University
Designed and implemented an integrated solution for the remote monitoring, assessment and support of seniors living independently at home using smart sensors and computer vision algorithms.

Service Activities

Honors

Press Coverage

Skills

Programming Languages: Python, C++, C, Java, x86 Assembly, Matlab, VHDL, Lua, Arduino, JavaScript, Swift, SQL, Ruby, Go, LaTex, R

Web Development: React, HTML, CSS (Sass/SCSS, Less, Atomic CSS), Bootstrap, jQuery, Node.js, Jinja2, MySQL, PHP, Flask

Libraries and Platforms: PyTorch, Tensorflow, Torch, Caffe, OpenCV, CUDA, Qt, Android, iOS, OpenGL, Boost, FPGA, Google Tango