Yan **Luo**

POSTDOCTORAL RESEARCH FELLOW

Harvard Ophthalmology AI Lab

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Research Experience

Harvard Ophthalmology AI Lab   *MA, USA*
POSTDOCTORAL RESEARCH FELLOW (POSTDOC ADVISOR: PROF. MENGYU WANG)   *Aug. 2022 - Present*

University of Minnesota   *MN, USA*
RESEARCH ASSISTANT (DOCTORAL ADVISOR: PROF. QI ZHAO)   *Jan. 2017 - Jun. 2022*

National University of Singapore   *Singapore, Singapore*
RESEARCH ASSISTANT (SUPERVISORS: PROF. MOHAN KANKANHALLI & PROF. QI ZHAO)   *May. 2013 - Dec. 2017*

Education

University of Minnesota Twin Cities   *Minnesota, USA*
PH.D. IN COMPUTER SCIENCE   *Jan. 2017 - Jun. 2022*
    Doctoral Advisor: Prof. Qi Zhao

National University of Singapore   *Singapore, Singapore*
PH.D. STUDENT IN COMPUTER ENGINEERING   *Jul. 2015 - Jan. 2017*
    Doctoral Advisor: Prof. Qi Zhao

Xi'an University of Science and Technology   *Shaanxi, China*
B.S. IN COMPUTER SCIENCE   *Sep. 2004 - Jul. 2008*

Research Interests

My research interests lie in the areas of machine learning and computer vision. Particularly, I'm interested in (1) how to improve the generalization and transferability of the learning process when the context varies, e.g., in a continual learning setting, and (2) how to assess the downstream effects of machine intelligence's generalizability, e.g., the trustworthiness of predictions, for the safe and effective use of AI models.

Publications

Yan Luo, Yongkang Wong, Mohan Kankanhalli, and Qi Zhao. (in review). "Learning to Predict Gradients for Semi-Supervised Continual Learning." arXiv preprint arXiv:2201.09196 (2022).

Yan Luo, Yongkang Wong, Mohan S. Kankanhalli, and Qi Zhao. (in press). "Learning to Minimize the Remainder in Supervised Learning." IEEE Transactions on Multimedia, Feb. 2022.

Yan Luo, Yongkang Wong, Mohan S. Kankanhalli, and Qi Zhao. "Learning to Predict Trustworthiness with Steep Slope Loss." In Advances in Neural Information Processing Systems, 2021.

Yan Luo, Yongkang Wong, Mohan S. Kankanhalli, and Qi Zhao. "n-Reference Transfer Learning for Saliency Prediction." In European Conference on Computer Vision, pp. 502-519. Springer, Cham, 2020.

Yan Luo, Yongkang Wong, Mohan S. Kankanhalli, and Qi Zhao. "Direction Concentration Learning: Enhancing Congruency in Machine Learning." IEEE transactions on pattern analysis and machine intelligence 43, no. 6 (2019): 1928-1946.

Yan Luo, Yongkang Wong, Mohan S. Kankanhalli, and Qi Zhao. "$\mathcal{G}$-Softmax: Improving Intraclass Compactness and Interclass Separability of Features." IEEE Transactions on Neural Networks and Learning Systems 31, no. 2 (2019): 685-699.

Yan Luo, Ming Jiang, and Qi Zhao. "Visual Attention in Multi-Label Image Classification." In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition Workshops, pp. 0-0. 2019.

Yan Luo, Xavier Boix, Gemma Roig, Tomaso Poggio, and Qi Zhao. "Foveation-Based Mechanisms Alleviate Adversarial Examples." arXiv preprint arXiv:1511.06292 (2015).

Yan Luo, Yongkang Wong, and Qi Zhao. "Label Consistent Quadratic Surrogate Model for Visual Saliency prediction." In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition, pp. 5060-5069. 2015.

Yan Luo, Ming Jiang, Yongkang Wong, and Qi Zhao. "Multi-Camera Saliency." IEEE Transactions on Pattern Analysis and Machine Intelligence 37, no. 10 (2015): 2057-2070.

Academic Service

Reviewer   TPAMI, TNNLS, CVPR 2019, ICCV 2019, AAAI 2020, CVPR 2020, ECCV 2020, NeurIPS 2020, WACV 2021, AAAI 2021, CVPR 2021, ICML 2021, ICCV 2021, NeurIPS 2021, WACV 2022, AAAI 2022, CVPR 2022, ICLR 2022, ICML 2022, ECCV 2022, NeurIPS 2022, ACCV 2022, WACV 2023, ICLR 2023, CVPR 2023

Experience

Harvard Ophthalmology AI Lab
MA, USA

Postdoctoral Research Fellow
Aug. 2022 - Present

- Design and develop novel deep learning models to boost the understanding of the correlation between human vision and computer vision.
- Apply R statistical methods to medical data to study eye diseases.

CoTwins Lab
MN, USA

Research Assistant (Supervisor: Prof. Scott Vrieze and Prof. Qi Zhao)
Dec. 2018 - Jul. 2022

- Developed and maintained iPhone App (CoTwins in the App Store), as well as the server hosted in Google Cloud Project.
- Served as a database administrator for the project. We used the MySQL database that was run in GCP.
- Performed statistical analyses using R.

JD AI Research
CA, USA

Research Intern (Supervisor: Dr. Jingen Liu)
Jun. 2021 - Aug. 2021

- Studied how domain change in the training data affects the continual learning process.
- Devised and developed an algorithm to alleviate catastrophic forgetting that results from the domain change in the training data.

Interactive & Digital Media Institute at NUS
Singapore, Singapore

Research Assistant (Supervisor: Prof. Mohan Kankanhalli and Prof. Qi Zhao)
Mar. 2013 - Jan. 2017

- Proposed and developed a novel and general method to predict important content in visual scenes from multiple sources (e.g., videos/images).
- Designed and conducted human experiments to see how people allocate their attention to multiple sources, and compare results with those of one source as in the conventional experimental setting.
- Developed algorithms to extract features and compute key eye parameters for clinical applications.

SmartClouder Inc.
Beijing, China

R&D Engineer
Nov. 2010 - Mar. 2013

- Developed a decentralized distributed system that performed better than the NAS product of NetApp Inc. This project addressed the shortcomings (at that time) of the existing commercial NAS system including disruption of the client-side service to reconfigure when the storage infrastructure was upgraded or expanded, the expensive price of commercial NAS product (NetApp FAS3240 costs 450,000 RMB) and the remarkable performance decline when increasing the number of files.
- Built a virtualization system including all functionalities of Amazon EC2 based on KVM virtualization infrastructure and improved its security by applying the VLan technique.

TeleNav Inc.
Beijing, China

R&D Engineer
Jul. 2008 - Nov. 2010

- Developed algorithms to improve two aspects of traditional route planning engines - increased the performance in long-distance routing (e.g., from Los Angeles to New York) and improved the quality in some particular road networks (e.g., two highways that are parallel at the beginning but intersect at the end). Our work outperforms other commercial geospatial engines in computing at that time.
- Developed a navigation system for mobile device users who cannot connect to a cell phone network (e.g., GSM or CDMA) or where the location is not covered by the network. By effectively addressing the memory limitation, this work was a pioneering work in navigation with mobile devices (where computational resources are highly constrained at that time).

Teaching

Teaching Assistant	CSCI 4511W: Introduction to Artificial Intelligence, Spring 2018
	CSCI 4511W: Introduction to Artificial Intelligence, Fall 2018
	CSCI 4511W: Introduction to Artificial Intelligence, Spring 2019
	CSCI 5481: Computational Techniques for Genomics, Fall 2019
	CSCI 5801: Software Engineering I, Spring 2020
	CSCI 5801: Software Engineering I, Spring 2021
	CSCI 4707: Practice of Database Systems, Fall 2021
	CSCI 5801: Software Engineering I, Spring 2022

Skills

Applications	Deep Learning, Machine Learning, Computer Vision, Medical AI
Programming	Python, R, Lua, Matlab, Java, C/C++
Deep Learning Frameworks	PyTorch, TensorFlow, Torch, Caffe
Working OS	Linux (Ubuntu/Linux Mint/MX Linux/Manjaro/Debian/CentOS/Elementary), MacOS, Windows
Cloud Computing	Google Cloud Project, Amazon Web Services
Supercomputing	University of Minnesota Supercomputing Institute (Slurm), National Supercomputing Centre Singapore (PBS Pro)
Tools	Podman, Docker, Git, MySQL, Cassandra, scikit-learn, Pandas, PySpark