

Nanbo Li

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RESEARCH INTERESTS

I am generally interested in *probabilistic machine learning*, *causality*, and *computer vision*, particularly *generative models* and *causal representation learning*. My PhD focused on developing machine learning models that learn to disentangle spurious correlations and identify modular generative structures within data, thus enabling interventional reasoning [1-4]. As my research closely connects to multiple well-established AI/ML/CV topics like *world models* [1-3,5], *uncertainty estimation* [1,7], and *visual scene understanding* [1-4], I am also excited about researching fundamental problems in these areas and their broad applications in healthcare, finance, and physics.

EDUCATION

The University of Edinburgh

Ph.D. in Machine Learning and Computer Vision

Edinburgh, UK

2018–2022

- Thesis Title: Generative Factorization For Object-Centric Representation Learning
- Supervisors: Prof. Robert B. Fisher (principal) and Prof. Chris Williams (second)

The University of Edinburgh

*M.Sc. in Artificial Intelligence (**with Distinction**)*

Edinburgh, UK

2016–2017

Wuhan University of Technology

*B.Eng. in Automation Engineering (**Outstanding Engineer**)*

Wuhan, China

2012–2016

WORK EXPERIENCE

Research Intern

Facebook Reality Labs

Zurich, Switzerland

Fall 2021

Research Intern

NEC Laboratories America. Inc

San Jose, CA, USA

Summer 2021

Researcher/Engineer

Trimbot2020 (European Union Horizon 2020 Programme)

UK & EU

2018–2020

Research Assistant

Prof. Fisher's Computer Vision Lab at The University of Edinburgh

Edinburgh, UK

2017–2018

SKILLS

- **Expertise:** Machine Learning, Computer Vision, Generative Models, Causal Representation Learning
- **Software:** Python, Linux, PyTorch, Tensorflow, Matlab, C++, Blender
- **Language:** English, Chinese (Mandarin)

SCHOLARSHIPS AND AWARDS

School of Informatics Scholarship

School of Informatics, The University of Edinburgh

Edinburgh, UK

2018

PUBLICATIONS

1. Learning Object-Centric Representations of Multi-Object Scenes from Multiple Views
Li Nanbo, Cian Eastwood, Robert B. Fisher
Advances in Neural Information Processing Systems (NeurIPS), 2020 (**Spotlight, top 4%**)
2. Object-Centric Representation Learning with Generative Spatial-Temporal Factorization
Li Nanbo, Muhammad Ahmed Raza, Hu Wenbin, Zhaole Sun, Robert B. Fisher
Advances in Neural Information Processing Systems (NeurIPS), 2021
3. Duplicate Latent Representation Suppression for Multi-Object Variational Autoencoders
Li Nanbo, Robert B. Fisher
The British Machine Vision Conference (BMVC), 2021
4. Align-Deform-Subtract: An Interventional Framework for Explaining Object Differences
Cian Eastwood^{1†}, **Li Nanbo**^{1†}, CKI Williams
International Conference on Learning Representations (ICLR) Workshop: Objects, Structure and Causality, 2022
5. Controllable Video Generation by Learning the Underlying Dynamical System with Neural ODE
Yucheng Xu, **Li Nanbo**, Arushi Goel, Zijian Guo, Zonghai Yao, Hamidreza Kasaei, Mohammadreza Kasaei, Zhibin Li
arXiv preprint arXiv:2303.05323, 2023
6. Hybrid Multi-Camera Visual Servoing to Moving Target
Hanz Cuevas-Velasquez^{1†}, **Nanbo Li**^{1†}, Radim Tylecek, Marcelo Saval-Calvo, Robert B. Fisher
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2018
7. DUGMA: Dynamic Uncertainty-Based Gaussian Mixture Alignment
Can Pu, **Nanbo Li**, Radim Tylecek, Robert B. Fisher
International Conference on 3D Vision (3DV), 2018 (**Oral presentation**)
8. *SDF-MAN: Semi-Supervised Disparity Fusion with Multi-Scale Adversarial Networks*
Can Pu, Runzi Song, Radim Tylecek, **Nanbo Li**, Robert B Fisher
Remote Sensing, 2019