

# Nanbo Li

Ph.D. | The University of Edinburgh  
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## RESEARCH INTERESTS

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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

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### 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

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### *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

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- **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

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### School of Informatics Scholarship

*School of Informatics, The University of Edinburgh*

*Edinburgh, UK*

*2018*

## PUBLICATIONS

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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 3%**)
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<sup>1†</sup>, **Li Nanbo**<sup>1†</sup>, 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<sup>1†</sup>, **Nanbo Li**<sup>1†</sup>, 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