

# Stefan Nielsen

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## Research Experience

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### FPT Software, AI Center

*Ho Chi Minh City, Vietnam*

*Research Resident*

*3/23 - present*

- Working in Professor [Tan Minh Nguyen](#)'s Mathematical AI lab (National University of Singapore)
- Focus on mathematical and statistical foundations of AI models, in particular Transformers and Mixture-of-Experts
- First-author publication, titled 'Elliptical Attention', in NeurIPS main conference which proposed integrating Mahalanobis distance into the attention mechanism to compute hyper-ellipsoidal attention regions, obtaining more robust and expressive attention mechanisms that outperform baseline transformers in numerous modalities

### Columbia University, Data Science Institute

*New York City, USA*

*Research Scholar*

*6/22 - 3/23*

- Working in Professor Talia Gillis's lab looking at machine bias and algorithmic fairness
- Focus on out-of-distribution robustness of exponentiated gradient algorithms for fair classification

### Columbia University, Zuckerman Institute

*New York City, USA*

*Research Assistant*

*9/22 - 12/22*

- Working in Professor Liam Paninski's lab in contrastive learning for spike sorting in computational neuroscience
- Focus on application of SimCLR versus baseline unsupervised and semi-supervised methods for cluster analysis

## Publications and Preprints

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### Tight Clusters Make Specialized Experts

**Stefan Nielsen**, Rachel S.Y. Teo, Laziz Abdullaev, Tan M. Nguyen  
International Conference on Learning Representations (ICLR) 2025

### Elliptical Attention

**Stefan Nielsen**, Laziz Abdullaev, Rachel S.Y. Teo, Tan M. Nguyen  
Neural Information Processing Systems (NeurIPS) 2024

### An Attention-based Framework for Fair Contrastive Learning

**Stefan Nielsen**, Tan M. Nguyen  
*preprint, 2023*

## Education

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### Columbia University

*New York City, USA*

*MA in Statistics (Cumulative GPA: 4.03/4.00)*

Courses: Neural Networks and Deep Learning, Advanced Machine Learning, Statistical Machine Learning, Nonparametric Statistics, Multivariate Statistical Inference, Elements of Data Science, Probability

### University of Cambridge

*Cambridge, UK*

*MPhil in Economics*

Thesis: Failed Coalition Formation under the Nash Bargaining Solution: Using Threat Point Uncertainty to Explain Non-participation

Courses: Econometric Methods, Economics of Networks, Applied Macroeconomics, Applied Microeconomics, Macroeconomics, Microeconomics

### London School of Economics

*London, UK*

*BSc in Philosophy, Politics, Economics (First)*

Courses: Real Analysis, Algorithms and Programming, Principles of Econometrics, Game Theory, Macroeconomic Principles, Microeconomic Principles, Set Theory and Further Logic, Mathematical Methods, Elementary Statistical Theory

## Awards / Honors

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<b>Huayu Enrichment Scholarship</b> , Government of Taiwan Fully funded scholarship to live in Taiwan and take intensive mandarin classes	2024
<b>Poster Presenter</b> , Neural Information Processing Systems (NeurIPS) Main Conference	2024
<b>Oral Presenter</b> , FPT Software AI Research Symposium	2024
<b>Funded Research Scholar</b> , Columbia University, Data Science Institute	2022-2023

## Service / Other

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<b>Reviewer</b> , International Conference on Learning Representations (ICLR)	2025
<b>Producer and Artist</b> , An Việt Archives, Hackney, London Produced <i>Well Settled</i> , a commissioned art piece by Hackney arts council drawing on the An Việt archives to explore the role of sound and its contribution to Vietnamese shared heritage in transnational contexts Produced <i>'Our Tones, Our Wrists, Our Home'</i> with Nic Anette Miller, archiving forms of Vietnamese sign language and its role in sharing the heritage of the deaf refugee community	2024
<b>Languages</b> : English (native), Vietnamese (advanced), German (intermediate)	