

Shelvia Wongso

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Research Interests

My research focuses on generalization, interpretability, and uncertainty quantification in deep neural networks, and on safety-related aspects of large language models such as misalignment and hallucination.

Keywords - generalization, explainability, uncertainty quantification, AI safety, misalignment, hallucination

Education

National University of Singapore PhD in Machine Learning Jan 2019 - Nov 2024

- GPA: 4.6/5.0
- Integrative Sciences and Engineering Programme
- **Thesis Title:** Generalization and Trustworthiness in Deep Learning Through the Lens of Information-Theoretic Measures (Supervisor: Mehul Motani)

Nanyang Technological University B.Sc. in Physics Aug 2014 - May 2018

- GPA: 4.8/5.0 (First Class Honours)
- CN Yang Scholars Programme
- Final Year Project (FYP) was conducted overseas at Paul Scherrer Institute, Switzerland.
- **FYP Title:** Sensitivity Analysis of the Beam Optics of a Superconducting Gantry for Proton Therapy (Supervisors: Chew Lock Yue and Marco Schippers)

Work Experience

- **Research Fellow** — Nanyang Technological University Jun 2025 – Present
Conducting research on improving the theoretical framework for uncertainty quantification in large language models.
- **Research Fellow** — National University of Singapore Oct 2024 – Apr 2025
Improved deep survival models for predicting the risk of Major Adverse Cardiovascular Events in hospital patients, in collaboration with SingHealth.
- **Machine Learning Engineer Intern** — Biomind Aug 2018 – Feb 2019
Used machine learning to do image registration and applied it to detect midline shift in patients based on their MRI scans.

Publications

- **Pointwise Information Measures as Confidence Estimators in Deep Neural Networks: A Comparative Study.** Poster presentation at International Conference on Machine Learning (ICML), 2025.
[Shelvia Wongso](#), Rohan Ghosh, Mehul Motani
- **Pointwise Sliced Mutual Information for Neural Network Explainability.** Oral Presentation at IEEE International Symposium on Information Theory (ISIT), 2023.
[Shelvia Wongso](#), Rohan Ghosh, Mehul Motani
- **Using Sliced Mutual Information to Study Memorization and Generalization in Deep Neural Networks.** Oral Presentation at International Conference on Artificial Intelligence and Statistics (AISTATS), 2023. Top 1.9 % of Submitted Papers.
[Shelvia Wongso](#), Rohan Ghosh, Mehul Motani
- **Rethinking symbolic regression: Morphology and adaptability in the context of evolutionary algorithms.** Poster Presentation at International Conference on Learning Representations (ICLR), 2022.
Fong Kei Sen, [Shelvia Wongso](#), Mehul Motani
- **Understanding Deep Neural Networks Using Sliced Mutual Information.** Oral Presentation at IEEE International Symposium on Information Theory (ISIT), 2022.
[Shelvia Wongso](#), Rohan Ghosh, Mehul Motani

Teaching Experience

University Courses at National University of Singapore

- **Teaching Assistant** — EE4211: Data Science for the Internet of Things Aug 2022 - Dec 2022
- **Teaching Assistant** — PC5202: Advanced Statistical Mechanics Jan 2022 - May 2022
- **Teaching Assistant** — EE4211: Data Science for the Internet of Things Aug 2021 - Dec 2021
- **Teaching Assistant** — EE4211: Data Science for the Internet of Things Aug 2020 - Dec 2020

Professional Activities

Reviewer of Proceedings in Neural Information Processing Systems (NeurIPS), International Conference on Machine Learning (ICML), International Conference on Learning Representations (ICLR), and International Conference on Artificial Intelligence and Statistics (AISTATS).

Honors and Awards

Scholarships

- Recipient of **NUS Graduate School Scholarship** for doctoral studies at the National University of Singapore
- Recipient of **ASEAN Scholarship** for undergraduate studies at Nanyang Technological University

Skills

Programming: Python (Tensorflow — Pytorch — Scikit), R, SQL, Docker

Languages: English (Fluent), Indonesian (Native), Japanese (Beginner), Chinese (Beginner)