Xudong Shen

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Research Interest

AI's catastrophic risks, social risks, & AI alignment, including language models, agents, & generative models, with a focus on increasingly capable AGI and superhuman AI.

Contact

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Education

Ph.D. in Computer Science, *National University of Singapore*, Singapore — 2019-2024

B.A. in Naval. Arch. & Ocean Eng., *Zhejiang University*, China — 2015-2019

Skills

Ethical & Safe AI:

Familiar with (*i*) the technical methods for ensuring the social alignment of AI (LLMs, text-to-image diffusion models,...) and (*ii*) AI governance.

ML and AI:

Experienced with (*i*) vision, NLP, generative, and multimodal models; (*ii*) image, sensor, sequential, language, and FinTech data.

Statistical Modeling:

Big data analysis and structural modelling using the `R` and `Python` stack. Experienced with survival modelling, financial default analysis, and social network data analysis.

Experience

Doctoral Researcher, **N-CRiPT Centre**, NUS, Singapore — 2019–2024

(a) Conduct research in ML and FinTech: (*i*) guarantee fairness in downstream tasks via pre-trained fair representations, (*ii*) structural modeling of million online peer-to-peer lending transaction data to estimate default risk, profitability, and discrimination.

(b) Communicated scientific insights to both academic and industry audience in 10 papers (4 first-authored) and 5+ talks.

(c) Assisted teaching the course *Computational Methods for Business Analytics* twice, totally 150+ hours to 200+ undergraduate students. Prepared weekly recap materials, videos, and Q&A sessions.

(d) Actively contributed to open-community projects in NLP, including BIG-Bench, natural language instructions, NL-Augmenter, and LLM's Inverse Scaling.

(e) Co-organized (*i*) the Responsible, Regutable AI working group at NUS and (*ii*) the Algorithms, Law, and Policy working group at EAAMO bridges (formerly MD4SG).

Research Intern, **Sea AI Lab**, Sea Limited, Singapore — Nov. 2022–Sep. 2023

(a) Worked on finetuning text-to-image diffusion models for fairness and led collaboration with 5 researchers from 2 institutes (NUS & Sea AI Lab). Published in ICLR 2024 with oral presentation.

Undergrad Researcher, **Second Institute of Oceanography**, China — Jul. 2017–Jul. 2019

(a) Worked on the full stack of satellite remote sensing image segmentation using `Python` & `Matlab`, incl. data preprocessing, labeling, neural net training and validating.

Undergrad Researcher, **Waseda University**, Japan — Sep. 2018–Feb. 2019

(a) Analyzed the effectiveness of Japan's policy toward the elimination of Persistent Organic Pollutants (POPs), and proposed policy recommendations to China.

Undergrad Researcher, **York University**, Canada — May–Aug. 2018

(a) Worked on fluid dynamics simulation of a hydrodynamically focused printing process for printed electronics, using `COMSOL` and `FLUENT`, in collaboration with 5 other researchers.

Publications

Publications on fairness:

1. **Xudong Shen**, Chao Du, Tianyu Pang, Min Lin, Yongkang Wong, Mohan Kankanhalli, "Finetuning Text-to-Image Diffusion Models for Fairness", In *ICLR* (2024), (Oral, top 1.2%).
2. **Xudong Shen**, Tianhui Tan, Tuan Q. Phan, Jussi Keppo, "Gender Animus Can Still Exist Under Favorable Disparate Impact: a Cautionary Tale from Online P2P Lending". In *ACM Conference on Fairness, Accountability, and Transparency (FAccT)* (2023).
3. **Xudong Shen**, Yongkang Wong, Mohan Kankanhalli, "Fair Representation: Guaranteeing Approximate Multiple Group Fairness for Unknown Tasks". In *IEEE Trans. PAMI* (2023).

Publications on AI safety and benchmarking:

4. Ian McKenzie, ..., **Xudong Shen**, ... (26 authors), "Inverse Scaling: When Bigger Isn't Better", In *TMLR* (2023).
5. Kaustubh D Dhole, ..., **Xudong Shen**, ... (125 authors), "NL-Augmenter: A Framework for Task-Sensitive Natural Language Augmentation". In *Northern European Journal of Language Technology (NEJLT)* (2023).
6. Aarohi Srivastava, ..., **Xudong Shen**, ... (450 authors), "Beyond the Imitation Game: Quantifying and Extrapolating the Capabilities of Language Models". In *JMLR* (2023).
7. Yizhong Wang, ..., **Xudong Shen**, ... (40 authors), "Benchmarking Generalization via In-Context Instructions on 1,600+ Language Tasks". In *EMNLP* (2022).

Publications on AI governance:

8. Ayse Gizem Yasar, Andrew Chong†, Evan Dong†, Thomas Krendl Gilbert†, Sarah Hladikova†, Roland Maio†, Carlos Mougan†, **Xudong Shen**†, Shubham Singh†, Ana-Andreea Stoica†, Savannah Thais†, "Integration of Generative AI in the Digital Markets Act: Contestability and Fairness from a Cross-Disciplinary Perspective", (2024), LSE working papers series. († = equal contribution)
9. **Xudong Shen**, Hannah Brown, Jiashu Tao, Martin Strobel, Yao Tong, Akshay Narayan, Harold Soh, Finale Doshi-Velez, "Directions of Technical Innovation for Regulatable AI Systems", In *Communications of the ACM*, (forthcoming).

Other publications on AI:

10. Ziwei Xu, **Xudong Shen**, Yongkang Wong, Mohan Kankanhalli, "Unsupervised Motion Representation Learning with Capsule Autoencoders". In *NeurIPS* (2021).

Talks & Presentations

ICLR conference 2024, Vienna, Austria	2024
SEA AI Lab, Singapore	2023, 2024
N-CRiPT Seminar, *National University of Singapore*, Singapore	2022, 2023, 2024
FAccT conference 2023, Chicago, USA	2023
International Conference on Smart Finance 2022, Online	2022
Workshop on Enormous Language Models, *ICLR conference 2021*, Online	2021

Service

Organizer: MD4SG Algorithms, Law, and Policy working group AY 2023/2024.

Area Chair: NeurIPS 2023 Regulatable ML Workshop.

Reviewer: EMNLP 2022, ICLR 2023, WACV 2023, ACL 2023.

Fellowships

DAAD AInet Fellow, *DAAD*, Germany	2024
Master Kong Dream Scholarship Program, *Waseda University*, Japan	Sep. 2018-Feb. 2019
Globalink Research Internship, *York University*, Canada	May.-Aug. 2018
Erasmus+ Student Mobility, *Università di Trento*, Italy	Feb.-Jun. 2017