

Research scientist and mathematician, with a focus on theory and interpretability of language models		
AREAS OF EXPERTISE	Natural Language Processing, Machine Learning, Data Science, Statistics, Category Theory, Algebraic Topology, Type Theory, Tensor Calculus, Linear Algebra	
APPOINTMENTS	NUS Business School	<b>Adjunct Assistant Professor</b> Jun 2022 – Present
	Institute of High Performance Computing	<b>Senior Scientist</b> Apr 2022 – Dec 2024
		Research Scientist Aug 2019 – Mar 2022
	Institute for Infocomm Research	Research Engineer Sep 2012 – Aug 2014
RESEARCH PROJECTS	Tensor-theoretic analysis of language models Jan 2025 – Present <i>Independent self-funded research</i>	
	<ul style="list-style-type: none"><li>Developed a tensor-theoretic framework for analyzing attention heads in transformers, derived bounds on the fact storage capacity of attention layers, and identified a common mechanism for generalizations and hallucinations in language models</li></ul>	
	Computational Inference of Public Attitudes and Opinions Feb 2021 – Dec 2024 <i>3 grant- and industry-funded projects</i>	
	<ul style="list-style-type: none"><li>Developed and evaluated an LLM prompt chain for end-to-end thematic analysis of focus group and interview transcripts in a highly traceable manner</li><li>Developed and piloted an LLM-powered chatbot for conducting automated online interviews that follow a topic guide and adhere to interview best practices</li><li>Trained an ensemble of fine-tuned BERT-based embedding models to predict psychological constructs with better accuracy than IBM Watson Personality Insights</li><li>Engaged key government and industry stakeholders, mentored graduate students, and delivered talks and tutorials on using LLMs in social science research</li></ul>	
	Heterogeneous Sense-making & Learning Networks Sep 2012 – Aug 2014 <i>A*STAR Sense &amp; Sense-abilities National Program</i>	
INDUSTRY PROJECTS	Match.io Platform for Founder-Matching Jun 2022 – Sep 2023	
	Team Effectiveness Profiling Platform Jul 2022 – Apr 2023	
	InPsyche Platform for Psychometric Profiling Mar 2020 – Aug 2020	
TEACHING	Foundations of Business Analytics Fall 2022, Fall 2023 <i>Core course for NUS Masters of Science in Business Analytics (~120 students/cohort) covering GLMs, SVMs, Random Forests, XGBoost and hypothesis testing</i>	
EDUCATION	<b>Ph.D. in Mathematics</b> , University of Washington, Seattle June 2019 <i>Thesis: The Grothendieck Construction in Enriched, Internal and <math>\infty</math>-category Theory</i> <i>GPA: 3.92 (Thesis advisor: James Zhang)</i>	
	<b>B.A. in Mathematics</b> , Cornell University May 2012 <i>GPA: 3.92 (Magna cum Laude, Distinction in All Subjects, Dean's List)</i>	

AWARDS	Letter of Commendation for Teaching, <i>NUS Business School</i>	2022 – 2023
	Ann Giles Graduate Fellowship, <i>University of Washington</i>	2018
	Academic Excellence Award, <i>University of Washington</i>	2014
	National Science Scholarship (Doctorate), <i>A*STAR</i>	2014 – 2019
	National Science Scholarship (Undergraduate), <i>A*STAR</i>	2009 – 2012
SELECTED PAPERS	<b>L.Z. Wong.</b> ‘ <i>Generalization is hallucination</i> ’ through the lens of tensor completions, arXiv:2502.17305 (2025).	
	<b>L.Z. Wong.</b> <i>Paying attention to facts: Quantifying the knowledge capacity of attention layers</i> , arXiv:2502.05076 (2025).	
	<b>L.Z. Wong</b> , P. Bhattacharya, B.S. Loh, A.E. Pink, et al. <i>Utilizing LLMs to conduct Thematic Analysis: A Case Study on Focus Groups Transcripts</i> , (under review).	
	<b>L.Z. Wong</b> , A. Juraimi, Y.Z. Tan, A.E. Pink, et al. <i>A Pilot Study Examining the Use of AI-powered Chatbots to Carry Out Qualitative Interviews</i> , (in preparation).	
	J.J.P. Simons, <b>L.Z. Wong</b> , P. Bhattacharya, B.S. Loh, & W. Gao. <i>From traces to measures: LLMs as a tool for psychological measurement</i> . arXiv:2405.07447 (2024).	
	H. Zhang, Q.N. Nguyen, W. Gao, <b>L.Z. Wong</b> , et al. <i>Enhancing Stance Classification on Social Media Using Quantified Moral Foundations</i> , IEEE/ACM ASONAM (2024).	
	Z. Lai, A.B. Ng, <b>L.Z. Wong</b> , S. See, & S.W. Lin. <i>Dependently typed knowledge graphs</i> , arXiv:2003.03785 (2020).	
	C. Kapulkin, Z. Lindsey & <b>L.Z. Wong</b> , <i>A co-reflection of cubical sets into simplicial sets, with applications to model structures</i> , New York Journal of Mathematics (2019).	
	J. Beardsley & <b>L.Z. Wong</b> , <i>The enriched Grothendieck construction</i> , Advances in Mathematics, 344 (2019).	
	<b>L.Z. Wong</b> , H.L. Chen, D.C.L. Chen & S.W. Lin, <i>Imputing Missing Values in Sensor Networks using Sparse Data Representations</i> , ACM MSWiM (2014).	
INVITED TALKS	<b>L.Z. Wong</b> , T.Q.S. Quek and M. Padilla, <i>An Ordinal Potential Function for Network Selection in Heterogeneous Wireless Networks</i> , IEEE ICASSP (2014).	
	<i>Applications of LLMs in Social Sciences</i> , AI Wednesdays (government-wide community of practice for artificial intelligence), Singapore (October 2024).	
	<i>An Introductory Workshop on using LLMs in Social Science</i> , Summer Institute in Computational Social Science (SICSS), Singapore (June 2024).	
LANGUAGES	Python (PyTorch, Numpy, Pandas, Scikit-learn, Transformers, Django, Flask, ...), Javascript (incl. React & Hooks), SQL, R English (native), Chinese, French	
HOBBIES	Puzzle hunts, Playing the cello, Board games, Learning languages, Kayaking	