Bingchen Wang

Independent Researcher (AI & Economics)

Focusing on LLM bias, mechanism design, and agent-based preference modeling

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Research Profile

Independent researcher at the intersection of AI and economics, with a track record of peer-reviewed contributions at top venues (AAAI oral) and cross-domain expertise spanning economics, statistics, and machine learning. Develops benchmarks, simulation frameworks, and alignment toolkits to bridge human-centered theory with AI system design.

Research Interests

Mechanism Design	Incentives for AI systems and future digital markets; auction theory; contract theory
Large Language Model	Bias & mitigation; benchmark design; agentic workflow
AI Alignment	Preference modeling; value alignment; evaluation
Economics & Statistics	Econometrics; climate economics; impact of AI on education & labor market; the future of work

Education

University of Oxford, St Hilda's College — *Oxford, UK*

MPhil in Economics (Distinction) — *Oct. 2019 - Jun. 2021*

- Thesis: *Detecting Parameter Shifts using Multiplicative-Indicator Saturation* (Distinction). Supervisors: Profs. David Hendry & Jennifer Castle.

Columbia University in the City of New York — *New York, U.S.A.*

B.A. in Mathematics-Statistics (Summa cum laude) — *Sep. 2016 - Dec. 2018*

- Phi Beta Kappa, Department Honors in Statistics, Dean's List; GPA: 4.13/4.33.

City University of Hong Kong — *Hong Kong SAR*

B.Sc. (Hons) in Computing Mathematics (First-Class Honors) — *Sep. 2014 - May 2016*

- HKSAR Government Scholarship recipient (territory-wide award for academic excellence and leadership), Dean's List; GPA: 4.13/4.3.

Publications

Feb. 2025 **Bingchen Wang***, Zhaoxuan Wu, Fusheng Liu, and Bryan K. H. Low. *Paid with Models: Optimal Contract Design for Collaborative Machine Learning*. *Proceedings of the Thirty-Ninth AAAI Conference on Artificial Intelligence* (AAAI-25), Philadelphia, Pennsylvania, U.S.A. **Oral, 4.6% acceptance.**

Under Review

2025 *Title withheld (under review) — Post-training alignment to human preferences*. Submitted to AAAI-26 (double-blind review).

Talks

Mar. 2025 Let's Talk About Trust — Paid with Models: Optimal Contract Design for Collaborative Machine Learning. End-of-Project Meeting, Trusted CollabML Lab, Singapore.

Mar. 2025 Fine-Tuning LLMs with Noisy Data for Political Argument Generation. Good-Data Workshop, AAAI-25, Philadelphia, U.S.A. (Presented on behalf of S. Churina & K. Jaidka.)

Mar. 2025 Paid with Models: Optimal Contract Design for Collaborative Machine Learning. AAAI-25, Philadelphia, U.S.A.

Experience

Independent Research — *Remote / Global*

Independent Researcher — AI & Economics — *Jul. 2025 – Present*

- Developed a novel large-language-model alignment framework, integrating structured agent generation with principled selection methods to match target human population preferences; manuscript under review (AAAI-26).
- Designing a bias evaluation benchmark for large language models, grounded in labor economic theory and algorithmic bias research.

National University of Singapore, Institute of Data Science — *Singapore*

Research Assistant (GLOW.AI) — Mechanism Design & Incentives in AI Systems — *Aug. 2023 – Jun. 2025*

- Led a research project applying contract theory to resolve incentive issues in collaborative machine learning, reformulating a non-convex optimal contracting problem into a convex form and deriving key properties of optimal solutions.
- Developed Python algorithms to compute optimal contracts and conducted numerical experiments, resulting in a peer-reviewed paper accepted for oral presentation at AAAI-25.
- Launched two AI–Social Science initiatives: bias evaluation in large language models for recruitment and LLM-agent design for social science research—now continued as part of independent research.

Independent Learning (AI & Computational Methods) *Remote*

Self-Directed Learning — Transition to AI & Computational Methods *May. 2022 – Jul. 2023*

- Completed Coursera's Python 3 Programming Specialization (University of Michigan), Machine Learning Specialization (Stanford & DeepLearning.AI), and Deep Learning Specialization (DeepLearning.AI); self-taught Python and audited Stanford CS229 (Machine Learning).
- Studied *The Elements of Statistical Learning* and explored literature on federated learning, laying the groundwork for later work on incentive design in collaborative machine learning at NUS.
- Authored *Learner's Corner*, a resource for independent learners with accompanying public GitHub notebooks.

The University of Hong Kong, Research Hub on Institutions of China *Hong Kong SAR*

Senior Research Assistant — Political Science & Empirical Econometric Analysis *Sep. 2021 – Apr. 2022*

- Cleaned and linked large-scale Chinese social science datasets (CGSS, CLDS, CFPS) to support political science research.
- Conducted exploratory data analysis in R to assess feasibility, shape research questions, and plan project timelines.
- Applied ordered logistic regressions, grouped Lasso, and complementary statistical tests to examine links between ideology on income justice and family background; authored the empirical analysis section of the academic paper.
- Contributed to peer review of academic manuscripts.

University of Oxford, Climate Econometrics Group *Oxford, UK*

Research Assistant — Climate Econometrics & Time Series Analysis *Oct. 2019 – Jun. 2021*

- Expanded and maintained large-scale datasets on anthropogenic contributions to atmospheric CO_2, sourcing and cleaning data from NASA, FRED, OECD, and national statistical bureaus.
- Composed documentation for data updates, created visualizations for initial analyses, and documented processes to support future research.
- Provided research assistance on econometric modeling, including parameter shift detection and time series model diagnostics.

Benchmarks & Tools

- **Framework for Post-training Alignment to Human Preferences**—Modular alignment system for aligning LLM agents with target population preferences through structured agent generation and principled selection. (In preparation for release; AAAI-26 submission, under double-blind review.)
- **LLM Bias Evaluation Benchmark**—Labor-economics-grounded dataset and evaluation protocol for LLM bias in recruitment contexts. Conceived and authored the system architecture, benchmark design and evaluation blueprint; implementation led by collaborator. (Internal research use.)

Selected Honors & Awards

2019	**Member,** The Phi Beta Kappa Society, Columbia University	*New York, U.S.A.*
2018	**Honor Society Fellow,** School of General Studies, Columbia University	*New York, U.S.A.*
2018	**Joseph and Norma Preziosi Endowed Scholarship,** Columbia University	*New York, U.S.A.*
2017	**Dean's Scholarship,** College of Science and Engineering, CityU	*Hong Kong SAR*
2015-16	**HKSAR Government Scholarship,** City University of Hong Kong	*Hong Kong SAR*
2014	**Chan Feng Men-ling Chan Shuk-lin ELC Scholarship,** City University of Hong Kong	*Hong Kong SAR*
2014	**Full Tuition Scholarship,** City University of Hong Kong	*Hong Kong SAR*
2014–18	**Dean's List (all enrolled semesters),** Columbia University & City University of Hong Kong	*Global*

Service & Outreach

Professional Service

Apr. 2025 Conference Volunteer, International Conference on Learning Representations (ICLR-25)

Public Engagement

Feb. 2021 "Hong Kong's Covid-19 testing regime must be refined so that it's not all stick, no carrots," *South China Morning Post*

Jun. 2020 "Why death of George Floyd should make the world take a good look at itself," *South China Morning Post*

Nov. 2019 "For Hong Kong, the only way out of a prisoner's dilemma is to give and take," *South China Morning Post*

Technical Competencies

Programming	Python, R, Pandas, NumPy, scikit-learn, PyTorch, MATLAB, Stata
Research Tools	Git, LaTeX, Jupyter, Overleaf, OpenAI API, Alibaba Cloud
Methods	Econometrics, regression analysis, simulation methods, numerical optimization
Languages	English (Fluent), Mandarin Chinese (Native), Cantonese (Intermediate)