Jieshu Wang | 汪婕舒

Postdoctoral Research Scholar, Decision Theater, Arizona State University
Research interest: Science of science; science and technology policy; invention and innovation; AI's social impacts; GenAI & future of work; climate change mitigation & adaptation; sustainability & workforce; computational social science.

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Blog: http://wangjieshu.com/ Google Scholar page

Education

2023 **Ph.D., Human and Social Dimensions of Science and Technology**, Arizona State University
- Dissertation: Combinatorial Inventions in Artificial Intelligence: Empirical Evidence and Implications for Science, Technology, and Organizations
- Committees: Andrew Maynard (chair), José Lobo, Katina Michael, Sébastien Motsch.

2018 **Master of Arts, Communication, Culture, and Technology,** Georgetown University
- Thesis: What's in Your Face? The Discrimination Issue of Facial Recognition Technology
- Advisors: Martin Irvine & Mark McCarthy

2016 **Postgraduate Diploma, Integrated Marketing Communications,** University of Hong Kong,
- Graduate with distinction

2009 **Master of Engineering, Civil Engineering,** Beijing Jiaotong University

2009 **Double Bachelor's Degree in Economics**, Peking University

2007 **Bachelor of Engineering, Civil Engineering**, Beijing Jiaotong University

Additional Trainings

2024/03 **Agent-Based Modeling: ASU and Math+ Cluster Berlin Joint Spring School on Agent-Based Modeling,** Arizona State University, Tempe, AZ, U.S.

2022/05 **Socio-Technical Systems: The Consortium for the Science of Sociotechnical Systems (CSST) Summer Research Institute**, University of Texas at Austin, Austin, TX, U.S.

Research Grants

2024/09 (pending) Co-PI of "Can Generative AI Invent?" (PI: José Lobo)
- **Funding**: Seeking $8,000 via an ASU Institute for Social Science Research seed grant.
- **Project Overview**: This project aims to pilot a study investigating how Generative AI (GenAI) can facilitate the invention process. The project intends to conduct in-depth interviews with 15-30 inventors and patent attorneys from ASU's Global Center for Technology Transfer and SkySong Innovation Center, as well as leading patent specialists in the Greater Phoenix area. The findings will be used to craft a grant proposal for the NSF SoS: DCI program.
- **Responsibilities**: I co-authored the grant proposal with PI Lobo.

2024/06 – 2024/11 Co-PI of "The Environmental Litmus Test for AI." (PI: Sola Kim)
- **Funding**: Awarded $3,000 by ASU's Earth Systems Science for the Anthropocene (ESSA) through a Summer Graduate Grant.
- **Project Overview**: This project, titled "Evaluating Large Language Models for Environmental Awareness Through Their Knowledge, Attitude, and Behavior," assesses the environmental awareness of LLMs and compares it to the U.S. general population's perspectives, focusing on potential environmental biases.

- **Responsibilities**: I co-authored the grant proposal with PhD student Sola Kim, whom I mentor. My role included designing the research methodology, organizing expert feedback workshops, and drafting the Institutional Review Board (IRB) documents. Additionally, I was involved in preparing the research pre-registration, refining the environmental awareness questionnaire, conducting queries with Large Language Models, and analyzing the data gathered.

2024/01 – 2024/09 Co-PI of "Large Language Models in Climate Action Planning." (PI: S.R. Aurora)

- **Funding**: Awarded $35,000 by ASU Knowledge Exchange for Resilience (KER), funded by the Virginia G. Piper Trust.
- **Project Overview**: The project focuses on exploring the current and potential uses of Large Language Models (LLMs) in climate action planning. It aims to establish a framework and set guidelines for effectively integrating LLMs into environmental strategies.
- **Responsibilities**: with PI Aurora, I lead critical facets of research design and execution. My responsibilities include identifying and recruiting research participants, conducting comprehensive interviews, and steering the forthcoming qualitative and quantitative data analyses. I successfully recruited 10 experts in the field of climate action, encompassing government officials, research scientists, professors, entrepreneurs, and AI scientists, and conducted in-depth interviews to gather diverse insights. Additionally, I manage the recruitment and supervision of two student research aides, overseeing the process from application review to interviewing, task assignment, and performance evaluation.

Publications & Conference Presentations

Published Papers

- **Wang, J.**, & Lobo, J. (2024). Extensive growth of inventions: Evidence from U.S. patenting. *Technological Forecasting and Social Change*, *207*, 123586. https://doi.org/10.1016/j.techfore.2024.123586
- **Wang, J.**, Kiran, E., Aurora, S. R., Simeone, M., & Lobo, J. (2024). ChatGPT on ChatGPT: An Exploratory Analysis of its Performance in the Public Sector Workplace. *Digital Government: Research and Practice*. https://doi.org/10.1145/3676281
- **Wang, J.**, Lobo, J., Shutters, S. T., & Strumsky, D. (2024). Fueling a net-zero future: The influence of government-funded research on climate change mitigation inventions. *Environmental Innovation and Societal Transitions*, *51*, 100836. https://doi.org/10.1016/j.eist.2024.100836
- **Wang, J.**, Maynard, A., Lobo, J., Michael, K., Motsch, S., & Strumsky, D. (2024). Knowledge Combination Analysis Reveals That Artificial Intelligence Research Is More Like "Normal Science" Than "Revolutionary Science." *Proceedings of the 57th Hawaii International Conference on System Sciences*, 5598--5607. https://hdl.handle.net/10125/107058
- Hsu, J. H.-P., **Wang, J.**, & Lee, M. (2022). Towards an Expectation-Oriented Model of Public Service Quality: A Preliminary Study of NYC 311. In F. Hopfgartner, K. Jaidka, P. Mayr, J. Jose, & J. Breitsohl (Eds.), *Social Informatics* (pp. 447–458). Springer International Publishing. https://doi.org/10.1007/978-3-031-19097-1_31
- Lee, M., **Wang, J.**, Janzen, S., Winter, S., & Harlow, J. (2021). Crowdsourcing Behavior in Reporting Civic Issues: The Case of Boston's 311 Systems. *Academy of Management Proceedings*, 2021(1), 16532. https://doi.org/10.5465/AMBPP.2021.16532abstract
- Pine, K. H., Hinrichs, M. M., **Wang, J.**, Lewis, D., & Johnston, E. (2020). For Impactful Community Engagement: Check Your Role. *Communications of the ACM*, *63*(7), 26–28.

Book Chapters

- [In press] Hinrichs, M., **Wang, J.,** Roe, C., & Johnston, E. W. (2025). AI integration in public service: A case study from Peoria, Illinois. In *Participatory Artificial Intelligence in Public Social Services: From Bias to Fairness in Assessing Beneficiaries*. Springer Nature Switzerland.

Working Papers, Preprints, and Technical Reports

- Li, R., & **Wang, J.** (2025). The Impact of Generative AI on the Urban Transportation Workforce. [Working Paper]
- Shutters, S. T., Lobo, J., & **Wang, J.** (2023). The Role of Occupational Socialness on the Productivity of Metropolitan Economies. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4659919
- Bernstein, M. J., **Wang, J.**, Bevaresh, S., Keeler, L. W., & Basile, G. (2021). *Social Value in Sustainability Assessment and Reporting*. Arizona State University, School for the Future of Innovation in Society, Global Futures Laboratory, and The Global KAITEKI Center.

Manuscripts Submitted

- [Submitted] **Wang, J.**, & Maynard, A. (2025). Unpacking Gender Disparity in U.S. Patenting. *Humanities and Social Science Communications*

Conference/Workshop Presentations

- **Wang, J.**, Lobo, J., & Shutters, S. (2024). *Poster: Using LLMs to Find Sustainability Capacity*. National Sustainability Society Conference, Seattle, WA, U.S.
- **Wang, J.**, & Solís, P. (2024). *Latent Workforce Capacities for Heat Solutions in Arizona*. National Sustainability Society Conference, Seattle, WA, U.S.
- Kim, S., & **Wang, J**. (2024). *Identifying Environmental Bias in Large Language Models*. National Sustainability Society Conference, Seattle, WA, U.S.
- **Wang, J.**, Aurora, S. R., Johnston, E. W., & Hinrichs, M. (2024). *Nothing about AI, Without AI: An Integrative Framework to Co-Produce Futures of Work.* Open and User Innovation Conference (Harvard Business School), Boston, MA. https://web.cvent.com/event/42f1768e-22f6-4d20-b7b1-6a7ee084d8ce/summary
- **Wang, J.** (2024). *Workforce Safety and Development with Extreme Heat*. Extreme Heat Policy Innovation Summit, Washington, D.C. https://fas.org/extreme-heat-summit/
- **Wang, J.** (2022). *Artificial Intelligence is already here. It's just not evenly distributed.* Conference on Governance of Emerging Technologies and Science, Phoenix, AZ, U.S.
- Lee, M., Harlow, J., Gordon, E., **Wang, J.**, Johnston, E., Janzen, S., & Winter, S. (2020). Toward Understanding Civic Data Bias in 311 Systems: An Information Deserts Perspective. *ACM CSCM 2020, ACM 978-1-4503-6819-3/20/04*.
- **Wang, J.** (2018). *The History of Artificial Intelligence in China: 1950s—1980s*. Annual Meeting of the Society for the History of Technology (SHOT), St. Louis, MO, U.S. [URL]

Invited Talks

- **Wang, J.** (2024, October). *Using LLMs to Analyze Workforce Data for Sustainability Research*. Center for Behavior, Institutions and the Environment, Arizona State University, Tempe, AZ, U.S.
- **Wang, J.** (2024, March). *Introduction to Patent Data Analysis*. Decision Theater, Arizona State University, Tempe, AZ, U.S.
- **Wang, J.** (2024, March). *Artificial Intelligence, Science of Science, and Future of Work.* Center on Technology, Data, and Society, Arizona State University, Phoenix, AZ, U.S.
- **Wang, J.** (2022, December). *Crowdsourcing Cities: Exploring 311 Data* [remote talk]. Northwestern Institute on Complex Systems (NICO), Kellogg School of Management at Northwestern University, Evanston, IL, U.S.

- **Wang, J.** (2019, January). *The Future of Artificial Intelligence* [Open Student Mini Workshop]. Artificial Wisdom Research Group, Graduate School of Advanced Integrated Studies in Human Survivability (GSAIS, aka Shishu-Kan), Kyoto University, Kyoto, Japan. https://aw.gsais.kyoto-u.ac.jp/images/poster20190119.pdf

Translations

- Menuez, D. (2021). 无畏的天才(*Fearless Genius: The Digital Revolution in Silicon Valley 1985-2000)* (**J. Wang**, Trans.). China Textile Press.
- Baumberg, J. J. (2021). 科学的隐忧：科学是如何工作与共享的(*The Secret Life of Science: How it Really Works and Why It Matters)* (**J. Wang**, Trans.). CITIC Press Corporation.
- Tegmark, M. (2018). *生命3.0 (Life 3.0: Being Human in the Age of Artificial Intelligence)* (**J. Wang**, Trans.). Beijing, China: Cheers Publishing.
    - Won the *Best Books of the Year Award* from the 21st Century Institute of Economic Research
- Kaplan, J. (2018). *人人都应该知道的人工智能 (Artificial Intelligence: What Everyone Needs to Know)* (**J. Wang**, Trans.). Beijing, China: Cheers Publishing.
- Tegmark, M. (2017). *穿越平行宇宙(Our Mathematical Universe: My Quest for the Ultimate Nature of Reality)* **(J. Wang**, Trans.). Cheers Publishing.

Selected Blog Posts and other public works

- **Wang, J.** (2021). AI-augmented Innovation Must Bend the Spoon. *Jieshu's Blog*. [URL]
- **Wang, J.** (2018). How to Expect a Smart Future: An Essay on Artificial Intelligence, Responsible Innovation, and Anticipatory Governance. *Jieshu's Blog*. [URL]
- **Wang, J.** (2018). The AI with Three Faces: A Hierarchical Framework for Analyzing AIs in Science Fiction Films. *Jieshu's Blog*. [URL]
- **Wang, J.** (2017). Symbolism vs. Connectionism: A Closing Gap in AI. *Jieshu's Blog*. [URL]
- **Wang, J.** (2017). How Will AI Impact Jobs? *Jieshu's Blog*. [URL]
- **Wang, J.** (2017). The Semiotics of Music: From Peirce to AI. *Jieshu's Blog*. [URL]
- **Wang, J.** (2015). How does AI Help Humans Fight HIV? *Jieshu's Blog*. [URL]
- *科技之巅：50 大全球突破性技术深度剖析 (The Peak of Technology: In-Depth Interpretations of the 50 Breakthrough Technologies)*. 1st Edition. Posts & Telecom Press, 2016.
    - Co-authored 17/50 chapters, including Deep Learning, Agile Robots, Baxter: The Blue-Collar Robot, 3D Transistors, etc.

Media Appearances

2018 **AI and Technological Unemployment**, interviewed by Wall Street CN, China

- Discussed the implication of AI on employment and my book translation (*Life 3.0*). [URL]

Academic Service

Peer Reviewer

- 2024, The ACM (Association of Computing Machinery) CHI conference on Human Factors in Computing Systems
- 2024, Humanities & Social Science Communications, 2024
- 2024, Hawaii International Conference on System Sciences (HICSS), 2024
- 2024, Journal of Digital Government: Research and Practice (DGOV), 2024
- 2021, Journal of Public Affairs Education (JPAE), 2021

Research Experiences

2023 – present **Postdoctoral Research Scholar, Decision Theater, Arizona State University**

- **Researcher for Knowledge Exchange for Resilience (KER)** funded by Virginia G. Piper Trust: in assisting with the development of Arizona's *Extreme Heat Preparedness Plan* for the Governor's Office of Resiliency, I conducted data analyses and visualization on the statistics and historical trends of heat-related injuries, deaths, hospitalization, and workplace exposure using data from multiple sources, including O*NET, Bureau of Labor Statistics, 911 calls, and Arizona Health Department of Services; developed a framework to identify latent workforce capacities for extreme heat solutions and applied the framework on Arizona's workforce; assisted in preparing, organizing, and facilitating the Interagency Resiliency Forum Workshop; assisted in preparing, organizing, presenting key findings regarding extreme heat and workforce development in the *Extreme Heat Policy Innovation Summit 2024*.
- **Co-PI of "Large Language Models (LLMs) in Climate Action Planning",** a project funded by Alumni Capstone Team for KER.
- **Co-PI of "The Environmental Litmus Test for AI"** funded by ASU's Earth Systems Science for the Anthropocene (ESSA).
- **Preliminary Research Initiative on Sustainability Capacities in the Workforce**: I initiated a research effort focused on using LLMs to identify sustainability capacities within the workforce. In collaboration with Professors José Lobo and Shade Shutters, we established a research agenda and conducted a pilot study. We are currently preparing grant proposals to secure funding and support the continued expansion of this research agenda.
- Computational Foundations for Bio-social Modeling of Unseen Pandemic (NSF #2200161): conducted qualitative analysis on interview data, assisted constructing a framework of augmented governance for future pandemics, participated in the Biosocial Modeling of Unseen Pandemics workshop.
- Conducting other research relevant to the Decision Theater.
- Mentoring Ph.D. students.

2020 – 2023 **Research Assistant, NSF # 1947271:** Can AI Invent? And if so, so what?

- Framed research questions and established research plans with the PIs.
- Data collection: automated the collection of patent datasets through programmatically querying PatentsView API via Python scripts; collected bulk patent datasets, census datasets, and other relevant datasets.
- Data cleaning, wrangling & preparation: conducted data cleaning and constructed domain-specific datasets for different research questions.
- Data analysis: performed a variety of analysis on large patent datasets via Python using pandas library, including statistical analysis, regression analysis, geographic analysis; generated novelty features for each patent and assignee; carried out network analysis using networkx and Gephi, including inventor networks and technology code networks.
- Conducted data visualization via Python using seaborn, matplotlib, and geopandas libraries.
- Compared AI patenting in major patent offices.
- Formulated plans for interviewing patent examiners, practitioners, and researchers.

2019 – 2022 **Research Assistant, NSF # 1816080:** Making Information Deserts Visible: Computational Models, Disparities in Civic Technology Use, and Urban Decision Making

- Conducted literature reviews for related domains, including public administration and civic engagement.
- Data collection: collected 311 and 911 datasets from multiple municipal open data platforms; automated the collection of relevant geographic datasets through programmatically querying Google Map and Google Place APIs; collected census datasets, geographic boundary datasets, voting datasets, and other relevant datasets.
- Data cleaning, wrangling & preparation: cleaned large data sets programmatically and semantically, including cleaning street address data using multiple techniques such as regular expressions; generated features for 311 reports and users for subsequent statistical and machine learning analysis.

- Data analysis: performed a variety of data analysis such as statistical analysis and regression analysis.
- Data visualization: conducted data visualization for publications via Python using seaborn, matplotlib, and geopandas libraries, including geographic visualizations; assisted the development of an online 311 visualization system.
- Led multiple explorative analysis, topics including needle pick-ups, civic engagement, and crimes.
- Survey: developed online survey questionnaire using Qualtrics, conducted pilot survey using Amazon Turks, formulated relevant IRB protocols.
- Mentoring: recruited and assisted mentoring one undergraduate student for NSF REU program.
- Logistics: prepared IRB documentations, organized and maintained the GitHub repository.

2019 – 2020 **Research Assistant, The Global KAITEKI Center of ASU:** The Future of Ageing in Smart Environments

- Reviewed ten ESG reporting and auditing frameworks, drafted in-depth summary and comparison of such frameworks.
- Conducted network analysis using Gephi regarding the collaborations among different types of organizations that have won Patent for Humanity Award by the USPTO.
- Participated in establishing a framework for assessing social values for the future of business.
- Assisted organizing the Future of Aging in Smart Environments Scenario Development (2020) workshop.

Teaching and Mentoring Experience

2022-2024 Mentor for Ph.D. Students, Human and Social Dimensions of Science and Technology program, School for the Future of Innovation in Society, ASU

- Mentored four Ph.D. students through multiple one-on-one sessions over two years, offering personalized guidance on research methodologies, paper publication, and career development.
- Facilitated and contributed to seminars for ten first-year Ph.D. students, providing insights, guidance, and advice on navigating academic challenges and opportunities in their fields.

2024 **Guest Lecturer, OGL-550**: Leading Organizational Change (ASU)

2024 **Guest Lecturer, OGL-360**: Assessment of Leadership Effectiveness (ASU)

- Artificial Intelligence, Project Management, and Organization Leadership

2024 **Guest Lecturer, HSD-598**: Introduction to Policy Informatics (ASU)

- Artificial Intelligence's Social Impact.

2023 **Guest Lecturer, CAS-394**: Harnessing Complexity (ASU)

- Artificial Intelligence and ethics.

2019 **Teaching Assistant, FIS-307**: Navigating Futures (ASU)

- Guest lectured about the future of AI, evaluated students' assignments, registered attendance, and maintained Canvas online teaching system.

2018 **Teaching Assistant, FIS-332**: Risk and the Future (ASU)

- Evaluated students' assignments, registered attendance, organized classes, and maintained Canvas online teaching system.

2017 **Teaching Assistant, CCTP-505**: Introduction to Communication, Culture and Technology (GU)

- Led recitation sessions, evaluated assignments, and registered lecture attendance, etc.

Honors & Awards

2024 – 2025 $10,000 - OpenAI Researcher Access Program

2024 Won two AI Innovation Challenges, a collaborative initiative between ASU and OpenAI

2024 $3,000 - ASU Earth Systems Science for the Anthropocene (ESSA) Summer Research Grant (shared with Sola Kim)

2024 $1,500 - ASU Library Open Access Fund award
2020 Silver Award in Excellent Popular Science Books, from Zhejiang (China) Association of Science Writers
2018 $300 - NSF Travel Grant for the Society for the History of Technology
2018 $500 - ASU Graduate & Professional Student Association Individual Travel Grant
2018 Best Books of the Year Award, from 21st Century Business Herald and 21st Century Institute of Economic Research
2013 Assistant Research Fellow at China National Intellectual Property Administration (CNIPA)
2012 Best-written office action notifications of the year, China National Intellectual Property Administration
2010 – 2013 Excellent Employee for 4 consecutive years at China National Intellectual Property Administration
2009 Outstanding graduate student, Beijing Jiaotong University
2005 ¥1,000 - Third-prize scholarship for outstanding study, Beijing Jiaotong University
2004 ¥2,000 - Second-prize scholarship for outstanding study, Beijing Jiaotong University

Professional Experience

2015 – 2016 **Co-Founder & Chief Operating Officer, Synced Technology Co., Ltd,** Beijing, China

- **Content operations**: assisted company website building, selected daily topics, composed articles, managed social media platforms; interviewed domestic and foreign AI experts, researchers, practitioners, and the representatives of leading AI companies.
- **Collaborations**: Established collaborative relationship with research institutes, universities, industrial labs, media agencies, and such; organized several symposiums including the Symposium on Philosophy of Mind and Cognitive Science, which was jointly hosted by RUC Science-Society-Humanity Forum.

2014 – 2015 **Editor & New Media Manager, Newton Science Magazine**, Beijing, China

- **Editing**: responsible for editing two columns (Science Sensor &We Talk) for the magazines, wrote and published many popular science articles; independently created ten issues of the digital magazine; drew illustrations and designed the covers.
- **Media platform operation**: handled content on multiple media platforms such as blog, Weibo, WeChat, and Toutiao.com.
- **Achievement**: the WeChat account I handled was ranked among the *Top 10 New Media for Science* in China; several articles had been reproduced by over 50 WeChat accounts, read more than 1 million times, and forwarded over 50,000 times; 68 articles have been recommended by Sina Blog, a leading blog website in China, 50 articles have been selected to be posted on the homepage of Sina Blog and 13 articles have been posted on the homepage of Sina.com.

2009 – 2014 **Patent Examiner & Assistant Research Fellow**, **Patent Office of China, China National Intellectual Property Administration,** Beijing, China

- Examined patents of industrial design and utility models.
- Lead a research project about preliminary examination.
- Created and served as the editor-in-chief for *New Trends*, the first departmental newspaper of the office.
- **Achievement**: Excellent Employee for 4 consecutive years, multiple best-written office action awards.

Skills

- **Language Skills:** Chinese (Native); English (Proficient).
- **Computational Skills**
  - **Programming language:** Python (advanced).
  - **Data Science:**
    - Proficient in data cleaning, data wrangling, statistical analysis, regression models, geospatial analysis, and data visualization.
    - Familiar with libraries including Pandas, Polars, GeoPandas, Numpy, statsmodels, seaborn, Matplotlib, scikit-learn, metaknowledge.
  - **Database**: SQLite
  - **Large Language Models**: iterative prompt engineering, familiar with OpenAI APIs
  - **Natural Language Processing:** text reprocessing, text mining, latent Dirichlet allocation (LDA) and Non-negative matrix factorization (NMF) topic modeling, wordcloud analysis, libraries (NLTK, genism, textacy)
  - **Other Machine Learning:** Basic knowledge about CNNs, GANs, RNNs, word embedding, Bayesian networks, statistical machine learning.
  - **Web**: Flask (basic), WordPress (intermediate), HTML (basic), CSS (basic).
  - **Network analysis:** Gephi (intermediate), VOS Viewer (intermediate), networkx (intermediate).
- **Qualitative Research Skills**
  - **Survey:** Qualtrics, Prolific, QuestionPro, Amazon Turks.
- **Others:** Auto CAD (intermediate).