

SHIYAN ZHANG

EDUCATION

Stevens Institute of Technology Ph.D., Data Science, School of Business	Hoboken, NJ May 2024
New York University M.S., Public Relations and Corporate Communication	New York, NY May 2014
Zhejiang University B.S., Advertising	Hangzhou, China June 2012

WORK EXPERIENCE

Lancaster University Management School Lecturer (Assistant Professor)	Lancaster, UK Starting June 2024
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RESEARCH INTERESTS

Future of Work, Human-AI Interaction, Skills and Occupations, Network Analysis

RESEARCH METHODS

Machine Learning, Network Science, Econometrics

MANUSCRIPTS IN PROGRESS

Cai, A., Offerman C., Zhang, S., Chilton, L., Nickerson, J.V. Machine Conversation as Creative Mechanism: Designing synthetic personae and their processes.

- Submitted to *Information Systems Research Special Issue on Analytical Creativity*
- The manuscript builds on an idea developed during the crowd camp at the Collective Intelligence Conference 2023. It explores the design space of machine conversations with multiple synthetic personae in a creative setting.
- Earlier versions of the paper were submitted to DESRIST 2024 and workshops at CHI 2024.

Zhang, S., Yan, B., Herve, J., and Nickerson, J.V. Occupations as Systems of Digital Skills: The Role of Decomposability.

- The manuscript builds on a previous ICIS paper and expands the network analysis from within occupation level to a multilevel analysis. It examines the structure of digital skills within and across occupations and their impact on job mobility.

Zhang, S., Yan, B., Hervey, J., and Nickerson, J.V. The Work Ecosystem: Software Technology Diversity and the Value of Occupations.

- Targeting *JMIS*; to be submitted by October 2024.

- This manuscript develops metrics to measure the diversity of technology usage in occupations and explore their effects on wage.
- It builds on a 2023 AOM meeting manuscript designated Best Paper and Best Student Paper Runner-up in the CTO division.

Zhang, S. and Nickerson, J.V. Creative Work and Occupation Innovation.

- Accepted at Collective Intelligence Conference 2023 as Works in Progress
- The manuscript analyzes the structure of creative tasks within occupations and its relationship to occupational innovation.

Predicting the Future of Work Using Graph Neural Networks (with Jeffrey V. Nickerson)

- The manuscript models various prediction problems in the future of work research into graph learning problems. Using graph neural network techniques, it aims to understand and predict the relationship between work and technology.
- This manuscript was presented at LMDE 2023 and will be developed into an article for IS or management journals by emphasizing its potential use in policy analysis.

Designing a Recommendation System for Green Occupation Transitions (with Justine Hervé)

- The manuscript addresses the need for workers to transition from dwindling brown occupations to more promising green occupations and designs a recommendation system that takes both skills and wages into consideration.

CONFERENCES AND WORKSHOPS

Cai, A., Offerman C., Zhang, S., Chilton, L., Nickerson, J.V. Upside Down Dialectics: A System for Generating Synthetic Design Conversation, Conference on Design Science Research in Information Systems and Technology (2024)

Cai, A., Offerman C., Zhang, S., Chilton, L., Nickerson, J.V. Designing with Synthetic Personae, LLM-Based Synthetic Personae and Data in HCI Workshop at CHI (2024)

Cai, A., Offerman C., Zhang, S., Chilton, L., Nickerson, J.V. Machine Conversations as Design Conversations, GenAICHI workshop at CHI (2024)

Zhang, S., Yan, B., Hervé, J., and Nickerson, J.V. The Work Ecosystem: Software Technology Diversity and the Value of Occupations, Academy of Management Proceedings (2023).

- CTO Division Best Student Paper Runner-up

Zhang, S. and Nickerson, J.V. Understanding and Predicting Changes in the Occupation Ecosystem, Leading and Managing in the Digital Era (2023)

Zhang, S. and Nickerson, J.V. The Coevolution of Tasks and Technologies. Academy of Management Annual Meeting (2022).

Zhang, S. and Nickerson, J.V. Occupation Modularity and the Work Ecosystem. Forty-Second International Conference on Information Systems (2021).

Zhang, S. and Nickerson, J.V. The Coevolution of Tasks and Technologies. ACM Collective Intelligence (2021)

Zhang, S. and Nickerson, J.V. Combinatoric Reorganization in Management Occupations as Machines Take on Cognitive Tasks. JAIS-MISQE Joint Special Issue workshop: "Artificial Intelligence in Organizations". Pre-ICIS Workshop in collaboration with SIM (2019)

Zhang, S. and Nickerson, J.V. Skill Shifts and Skill Rebundling as Machines Take on Cognitive Tasks. Artificial Intelligence and Work: AAAI 2019 Fall Symposium (2019)

Zhang, S. and Nickerson, J.V. Executives Who Know Python: Jurisdiction and Skill Shifts Among Management Occupations as Machines Take on Cognitive Tasks. Organization Science Special Issue on Emerging Technologies and Organizing Workshop at UC Santa Barbara (2019)

Zhang, S. and Nickerson, J.V. The Relationship between Software Skills, General Skills, and Emerging Occupations. Workshop on Digital Practices: Unpacking the New Logics of Organizing in a Digital Age at Academy of Management (2019)

Nickerson, J.V., Zhang, S., and zur Muehlen, M. 2018. *Designing Work*, Workshop on Power Struggles in the Digital Economy at CSCW.

PRESENTATIONS

Occupations as Systems of Digital Skills: The Role of Decomposability, Aarhus Business School, November 2023

Occupations as Systems of Digital Skills: The Role of Decomposability, Tilburg University, November 2023

Occupations as Systems of Digital Skills: The Role of Decomposability, ESADE Business School, October 2023

Occupations as Systems of Digital Skills: The Role of Decomposability and Transferability, CUHK, September 2023

Occupation Modularity and Labor Market Outcomes: A Multi-level Network Analysis, Learning and Employment Record (LER) Workshop, Case Western Reserve University, January 2023

DOCTORAL CONSORTIUM

Leading and Managing in the Digital Era Doctoral Consortium, Syros, Greece, June 2023

Academy of Management CTO Doctoral Consortium, Seattle, WA, August 2022

ICIS Doctoral Consortium, Copenhagen, Denmark, December 2022

TEACHING AND MENTORING EXPERIENCE

Stevens Institute of Technology

Hoboken, NJ

Instructor, Management of A.I. Technologies, School of Business

- Updated the syllabus and lectured the course of Management of A.I. Technologies, covering topics including image recognition, autonomous vehicles, and generative A.I. (3 credits, 150 mins/week).
- Taught 46 graduate level students from varied disciplines. The course, based in the business school, mainly attracts business analytics and information systems master's students, but also welcomes computer science students. The average student course rating for *Instructor Effectiveness* was 4.9/5.0. The average student course rating for *Overall Quality of Course* was 5.0/5.0.

Mentor, undergraduate research fellows

- Mentored over the years 10 undergraduates funded through NSF REUs and internal fellowships for undergraduate research. As part of this, advised students on research techniques, analysis methods, and poster design/presentation skills.

GRANTS & FELLOWSHIPS

Stevens Doctoral Fellowship

2018-present

This fellowship has been funded by two consecutive grants from the National Science Foundation. The Future of News Work program is ongoing and has provided opportunities to collaborate with investigators at Columbia University and Syracuse University, as well as to attend NSF-sponsored conferences and workshops.

2128906 NSF: Collaborative research: FW-HTF-R: The future of news work: Human-technology collaboration for journalistic research and narrative discovery, October 2021, \$1,842,650 total across three institutions, \$535,950 for Stevens (Jeff Nickerson, PI at Stevens; Kevin Crowston, PI at Syracuse; Lydia Chilton, PI at Columbia; Keren Henderson, Co-PI at Syracuse; and Mark Hansen, Co-PI at Columbia. Overall project lead is Kevin Crowston)

1909803 CHS: Small: Exploring Design and Evaluation Space through Crowds and Communities Jeffrey V. Nickerson (PI), \$499,932. 10/1/ 2019 -9/30/2022.

ACADEMIC SERVICE

Reviewer

- International Conference on Information Systems (ICIS)
- Hawaii International Conference on System Sciences (HICSS)
- International Conference on Design Science Research in Information Systems and Technology (DESRIST)

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COMMUNITY SERVICE

Volunteer

- Hoboken Cove Community Boathouse

- Ke Aloha Outrigger Club

PROFESSIONAL ASSOCIATION MEMBERSHIP

Academy of Management (AOM)

Association for Information Systems (AIS)

The Work in the Age of Intelligent Machines Research Coordination Network (WAIM RCN)

Association for the Advancement of Artificial Intelligence (AAAI)

Association for Computing Machinery (ACM)

INDUSTRY EXPERIENCE

TripleCare

New York, NY

Operations and Marketing Coordinator

August 2014 – April 2018

- Managed projects including new client onboarding, industry research, reports building, physician management and training.
- Initiated content strategy and led content conception, creation, repurpose and distribution.
- Analyzed internal database with over 15,000 medical encounters using SQL to assist content developing and other data projects.

TECHNICAL SKILLS

Data Analytics (Python, R, SQL), Econometrics (Stata), Data Visualization (Tableau, Matplotlib), Network Analysis (networkx, Gephi), Machine Learning (TensorFlow, scikit-learn), NLP (nltk, Gensim, spaCy), Graph Neural Network (StellarGraph)