Haoyu Sheng

PhD Candidate · Economics

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Education

Brown University *Providence, RI*

Ph.D Candidate in Economics *2020 - Present*

M.Sc in Computer Science *2022 - Present*

- Research Areas: Macroeconomics, Monetary Economics, Production Networks, Machine Learning.

Williams College *Williamstown, MA*

B.A. in Computer Science and Economics with Highest Honors *2016 - 2020*

Working Papers

"Unemployment in a Production Network," with Finn Schüle

Abstract: We model a production network economy with sectoral and occupational unemployment by incorporating matching between job-seekers across various occupations and employers in different production sectors. In combination, these two realistic features of any modern economy lead to large and pervasive unemployment responses across sectors and occupations. In addition, our model predicts larger output responses relative to an efficient production network. We demonstrate the empirical significance of our novel propagation mechanism by calibrating our model to the U.S. economy. A 1% productivity shock to the durable manufacturing sector results in a 0.41% increase in real GDP, and a 0.22pp decrease in unemployment. In contrast, in an efficient production network model, the same shock results in a 0.26% increase in GDP and no change in unemployment.

"Gender and Tone in Recorded Economics Presentations: Audio Analysis with Machine Learning," with Amy Handlan

Abstract: This paper measures seminar dynamics using a replicable, scalable, machine-learning approach and finds a gender-tone gap in economics presentations. We train a deep convolutional neural network to impute labels for gender, age, and tone-of-voice. We apply this to recorded presentations from the 2022 NBER Summer Institute to measure tone at a high frequency, which allows us to provide novel results on how economists interact with each other in talks. We find that female economists are more likely to speak in a positive tone and less likely to be spoken to in a positive tone, even by other women. We find that male economists are significantly more likely to sound angry or stern compared to female economists. Overall, we conclude that gender biases in economics presentations exist across fields and presentation formats.

Published Papers

"When Rooks Miss: Probability through Chess," with Steven Miller and Daniel Turek
The College Mathematics Journal, 2021

"Assessing Post-hoc Explainability of the BKT Algorithm," with Iris Howley and Tongyu Zhou
2020 AAAI/ACM Conference on AI, Ethics, and Society (AIES'20), 2020

"Knowledge Distillation for Recurrent Neural Network Language Modeling with Trust Regularization," with Yangyang Shi, Mei-Yuh Hwang, and Xin Lei
ICASSP 2019 - 2019 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2019

Research Assistance

2021-2022 Research Assistant for Professor Amy Handlan, Brown University
2021 Research Assistant for Professor Pascal Michaillat, Brown University
2019 Research Assistant for Professor Kenneth Kuttner, Williams College

Teaching Assistance

Spring 2022 Machine Learning, Text Analysis, and Economics (Undergraduate), Professor Handlan, Brown University
Spring 2020 Game Theory (Undergraduate), Professor Rai, Williams College
Fall 2019 Global Macro Instability and Finance (Undergraduate), Professor Phelan, Williams College
Fall 2017, Spring 2019 Intermediate Micro (Undergraduate), Professors Rai and Sheppard, Williams College

Honors and Awards

2023 Bravo Center Research Award, Brown University
2022 - 2024 Open Graduate Education Fellowship, Brown University
2020 Graduate Fellowship, Brown University
2019 Carl Van Duyne Prize in Economics , Williams College
2018 Class of 1960 Scholar in Computer Science, Williams College
2018 Class of 1960 Scholar in Economics, Williams College

Presentations and Workshops

2023 ASSA CSWEP, Brown Macro Breakfast, WEAI, Midwest Macroeconomics Meetings
2022 Brown Macro Breakfast, NBER Behavioral Macro Bootcamp, NBER Heterogeneous-Agent Macro Workshop

Other Experiences

2022-2023 Organizer of the Brown Macro Breakfast, Brown University
Fall 2018 Computer Science Research Assistant for Professor Iris Howley, Williams College
Summer 2018 Research Intern, Mobvoi AI Lab
Summer 2017 Summer Quant Analyst, Hutchin Hill Capital

Skills

Programming Languages Python (pandas, numpy, nltk, tensorflow, pytorch, and librosa), Java, Javascript, R, C++