Chunyu Guo
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Recommendation letter writer: Prof. Cuicui Chen,
Department of Economics, SUNY Albany
Email: cchen27@albany.edu

February 2nd, 2023

Dear NBER Innovation Boot Camp panel members:

I am writing to apply for the 2023 NBER Innovation Boot Camp. I am currently a Ph.D. candidate at the State University of New York at Albany and expect to graduate by May 2024. I believe the new experience at NBER Innovation Boot Camp will expose me to new frontiers and help me further explore my research areas.

My research interests include industrial organizations and environmental economic. During my earlier academic journey, I started exploring technology innovation with environmental economics when helping my Ph.D. advisor, Prof. Cuicui Chen, on her study of examining the firm's collusion behavior in adopting new technology under environmental regulation and the corresponding social welfare changes. Inspired by her studies and observing the speeding technology innovation in the current days, such as electric vehicles and carbon capture technologies, I realize a large part of the social costs are hidden behind the enormous visible benefits of the new technology innovation and adoption. For example, the adoption of electric vehicles triggers concerns over environmental justice, such that the growing electricity demands increase the pollution emission in disadvantaged areas where the electricity generators are usually located. It is hard to reduce these costs with existing technologies. Therefore, providing incentives to develop new environmentally friendly technologies should be the focus of environmental policy.

I have benefited greatly from past experience of attending workshops and conferences. For instance, Prof. Janet Currie's speech during the 2019 UC Berkeley summer camp inspired my job market paper idea. Last year my project with my advisor was presented at the NBER Distributional Consequences of New Energy Technologies Capstone Conference, I was amazed by the comments and feedbacks provide by the attendees. Therefore, I am excited about the NBER Innovation Research Boot Camp to gain more frontier knowledge and engage in discussions with top scholars in the field.

Thank you very much for your consideration, and I look forward to hearing from you.

Sincerely,

Chunyu Guo
Ph.D. Candidate
Department of Economics
The State University of New York at Albany, NY

CV:

Chunyu Guo

Email: cguo4@albany.edu Address: 233 Hudson Building, 1400 Washington Ave., NY12222

EDUCATION

Ph.D. candidate **State University of New Yok at Albany** Aug.2018-present

M.P.P. **Michigan State University** May. 2017

B.A. **China Sichuan University** July. 2016
- Major: Public Administration
- Honor: China National Scholarship

Feb.2015

Taiwan National Sun Yat-Sen University (Exchange study)
- Major: Political Economy

WORKING PAPER

- *"Regulator Preferences and Underinvestment in Water Infrastructure"*
- *"Distributional Consequences of Electrifying the Truck Industry: The Role of Charging Infrastructure Technology"* with Cuicui Chen, Daiqiang Zhang
- *"Impact of Water Mergers on Water Quality"* with Mike Abito
- *"Impact of Heat Wave on Human Mortality"* with Kai Zhang

Grants and Award

2022 GSA Association Professional Development Grant, SUNY Albany

2022 WISH/Project SAGES Seed Grant

2021 Pong-Lee Award for excellence in Third-Year Paper, SUNY Albany

2021 GSA Association Research Grant, SUNY Albany

2014 Exchange Study Scholarship, Sichuan University

2013 Outstanding Student, Sichuan University

2013 China National Scholarship, Sichuan University

Teaching Experience

Lecturer Albany, NY

Principles of Microeconomics 2021 winter

Principles of Macroeconomics 2022 winter

Teaching Assistant Albany, NY

Microeconomics II (PhD level) 2020 Spring

Public Finance (Undergraduate level) 2020 Spring

Mathematics (PhD level) 2019 Fall

International Trade (Undergraduate level) 2019 Fall

Principals of Economics (Undergraduate level) 2018 Fall

PROFESSIONAL EXPERIENCE

Research Assistant, Supervisor: Kai Zhang Sep. 2022-present

School of Public Health, SUNY Albany Albany, NY

Research Assistant, Supervisor: Cuicui Chen Albany, NY

Research Foundation for the State University of New York May.2020-Aug.2021

Economic Affairs Analyst NYC, NY

United Nations Department of Economic and Social Affairs Oct.2017-April.2018

Policy Analysis Intern Lansing, MI

Michigan Department of Environmental Quality Sep.2016- May.2017

CONFERENCE AND WORKSHOP

2022: AEA (Online);

AERE Summer Conference (Miami, FL);

NBER Distributional Consequences of New Energy Technologies Capstone Conference (Boston, MA);

Online Summer Workshop in Environment, Energy, and Transportation (Online);

Occasional Workshop in Environmental and Resource Economics (Santa Barbara, CA);

Workshop on the Social Costs of Water Pollution (Washington D.C.);

2021: NBER/Sloan Distributional Consequences of New Energy Technologies Conference (Online);

ACADEMIC WORKSHOP:

2019: UC Berkeley Summer School in Environmental and Energy Economics (Berkeley, CA);

2017: Inter-University Consortium for Political and Social Research Summer Program (Ann Arbor, MI)

TECHNICAL SKLLS

Computer literate: R, STATA, Matlab, Python, SQL, QGIS, ArcGIS, LaTeX

Languages: Chinese, English

Completed PhD courses:

AECO	600	Microeconomics I
AECO	601	Macroeconomics I
AECO	610	Mathematical Economics I
AECO	620	Econometrics I
AECO	621	Econometrics II
AECO	700	Microeconomics II
AECO	701	Macroeconomics II
AECO	720	Econometrics III
AECO	802	Time Series Analysis
AECO	803	Health Economics
AECO	721	Applied Econometrics
AECO	802	Industrial Organization
AECO	803	Labor/Public Economics
AECO	802	Contract Theory
AECO	803	Environmental & Energy Economics
AECO	800	Workshop in Microeconomics

Current PhD courses:

AECO	899	Doctoral Dissertation

Research Statement

My research interests focus on the interaction between technology innovation and environmental justice. the core strand of my research aims to understand the social injustice from environmental perspective. This area of research is motivated by existing infrastructure failure across the U.S. and the current efforts to promote clean energy vehicles that can support the goal of social justice. This statement summarizes my current work and outlines my future research plans.

I am interested in studying the interaction between technology innovation and environmental justice. For example, of my ongoing work with Cuicui Chen and Daiqiang Zhang, we investigate how charging infrastructure affects the adoption of electric trucks and the associated spatial distribution of local air pollution. We identify charging infrastructure designs that best deliver on the environmental justice goal of truck electrification. We start by building a micro-founded framework that quantifies environmental injustice based on the theoretical literature on income inequality. To apply this framework to truck electrification, we first estimate transport mode choices and spatial pollution models, and find that truck electrification saves$5 billion in annual local air pollution damages if charging stations are widely avail-able. In this infrastructure scenario, tailpipe pollution reduction narrows inequality and improves welfare, although added power plant pollution dampens these effects. This infrastructure scenario also reduces the extent of inequality explained by race.

In the future study, I expect to explore more on the natural monopolies' decisions on technology innovation. For example, water utility is a highly capital-intensive industry where the technology development adoption can be helpful in leakage detection and water pollution control to protect the public welfare. However, public water systems face the challenge of underinvestment because local government officials are often restrained from enacting unpopular water price rises for political purposes, or they may allocate water funds to close gaps in other local financial budgets rather than investing in water infrastructure improvement and adopting new technology. In my current job market paper, I build a dynamic framework and recover the intertemporal consequences of water infrastructure investment decisions, recognizing water price adjustment and water quality change. For future research, I am interested in how the water utility consolidation invokes more investment in technology adoption for water quality improvement.

Through this NBER Innovation Summer Boot Camp, I expect to gain more frontier and comprehensive knowledge in innovation economics, especially how the lessons of the economics of technological change have been applied in other various fields, such as public health and environmental protection. Going over the work done by the presenters in this camp, I gained lots of inspiration about how innovation economics interacts with various research areas. Professor John Van Reene's 2016 publishment "Carbon Taxes, Path Dependency, and Directed Technical Change: Evidence from the Auto Industry" used to bring me lots of inspiration when I was a research assistant for a project on green technology innovation. I look forward to further interaction with these professors about their views on innovation economics.

UNIVERSITY AT ALBANY
State University of New York

Department of Economics
College of Arts and Sciences

Cuicui Chen
Assistant Professor of Economics

Email: cchen27@albany.edu
Phone: 518-442-4933

February 7, 2023

To Whom It May Concern,

I am very pleased to recommend Chunyu Guo for the NBER Innovation Research Boot Camp. Chunyu is a fourth-year PhD student in economics SUNY Albany. She has worked as a research assistant for my research on the automobile market, has been working with me on research on electric trucks, and I have been advising her dissertation research on investment in water infrastructure.

She has keen interest in developing an innovation research project. As my research assistant, she demonstrated her capabilities in innovation research by analyzing the technology adoption pattern in the European automobile industry for the past 70 years. Chunyu is one of the top PhD students I have encountered as SUNY Albany: she thinks about important questions, learns quickly, performs research tasks exceptionally well, and is very resourceful in gathering data.

I am delighted to offer this strong recommendation for Chunyu for the Innovation research bootcamp. If you have any questions, please let me know.

Sincerely,

Cuicui Chen

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