Jiarui (Jerry) Qian
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December 28, 2025

National Bureau of Economic Research
Entrepreneurship Research Boot Camp 2025

Dear Review Committee Members,

I am writing to express my interest in attending NBER's 18th *Entrepreneurship Research Boot Camp* in the summer of 2025. I am a Ph.D. student in Economics at the University of Virginia. I entered the program in 2022 and is expected to graduate in 2028. My research interests include Entrepreneurship, the Economics of Science, Innovation, and Development Economics. I believe my research interests align closely with the objectives of the summer school, and it will be a great opportunity for me to learn about the research frontier from leading scholars and to share my work with peers who are also interested in this topic.

I have included the following materials for your reference:

- A copy of my Curriculum Vitae.
- A personal statement that includes a description of my current working paper, an agenda of topics I would like to explore in the future, and specific reasons for my interest in attending this program.

I would also like to highlight that one of my advisors, Prof. John Pepper, has kindly agreed to write a recommendation letter on my behalf. Prof. Pepper is well-positioned to attest to my academic abilities, research potential, and commitment to this field. He can be reached via email at jvp3m@virginia.edu.

Thank you for taking the time to consider my application. Please let me know if you have any questions or require any additional materials. I am eager to exchange ideas with others studying this critical area and contribute to the prosperity and progress of this field in the future.

Sincerely,
Jiarui (Jerry) Qian

JIARUI (JERRY) QIAN

(434) 882-3425 ⋄ jqian21@virginia.edu
210 Maury Ave ⋄ Charlottesville, VA 22903

EDUCATION

University of Virginia *Aug 2022 - Current*
Ph.D. in Economics
Committee: Anton Korinek, akorinek@virginia.edu, (240) 575-0995
John Pepper, jvp3m@virginia.edu, (434) 924-3402
Sandip Sukhtankar, srs8yk@virginia.edu, (434) 924-3692

University of Chicago *Sept 2018 - June 2020*
M.A. in Public Policy with a Certificate in Research Methods

China Agricultural University *Sept 2014 - June 2018*
B.A. in Agricultural Economics

FIELDS OF INTEREST

Entrepreneurship, the Economics of Science, Innovation, and Development Economics

WORKING PAPER

"AI in the Lab: AlphaFold's Impacts on the Human-Produced Knowledge"
"Digital Regulation and Cloud Computing Competition: Evidence from EU Data Act" (In Progress)

RESEARCH EXPERIENCE

Research Assistant for Prof. Eric Young, University of Virginia *2023 - 2024*
Project: "Health Savings Accounts and life-cycle saving"

Research Assistant for Prof. David Y. Yang, Harvard University *2020 - 2022*
Project: "Policy Experimentation in China: The Political Economy of Policy Learning"
(*Forthcoming, Journal of Political Economy*)

Bartlett Research Fellowship with Prof. Shaoda Wang, University of Chicago *2019 - 2020*
Project: "Court Capture, Local Protectionism, and Economic Integration: Evidence from China"

TEACHING EXPERIENCE

Graduate Teaching Assistant, University of Virginia *Fall 2023 - Spring 2025*
ECON 7710: Econometrics I (PhD) with Prof. Denis Nekipelov
ECON 7720: Econometrics II (PhD) with Prof. John Pepper
ECON 3720: Introduction to Econometrics (UG) with Prof. Stefan Ruediger

Part-time Grader, China Europe International Business School (CEIBS) *Fall 2021 - Fall 2024*
ECON 052: Economic Growth and Innovation (MBA/EMBA) with Prof. Xiaonian Xu

SEMINARS & CONFERENCES

NBER Digital Economics and AI Tutorial & Meeting, Stanford University *Spring 2025*
IFP Economics of Ideas, Science, and Innovation Online PhD Short Course *Spring 2024*
Workshop on Entrepreneurial Finance and Innovation *Spring 2024, Fall 2024*

AWARDS & HONORS

Snavely Prize for Best Second Year Paper, University of Virginia *2024*
National Scholarship, Ministry of Education of the People's Republic of China *2017*

My research fields are Entrepreneurship, the Economics of Science, Innovation, and Development Economics. Specifically, I examine how Artificial Intelligence (AI) technology, arguably the most important technological breakthrough in recent years, affects productivity. I am also interested in how we may (re)evaluate the regulation framework for certain industries experiencing significant digitalization transformation.

In my second-year summer paper, **"AI in the Lab: AlphaFold's Impacts on Human-Produced Knowledge"**, I systematically evaluate AlphaFold's influence on structural biology. Developed by Google DeepMind and awarded the 2024 Nobel Prize in Chemistry, AlphaFold predicts protein 3D structures with experimental-level accuracy at a fraction of the cost. Using AlphaFold's confidence score for each protein's prediction to define my treatment, I employed a Difference-in-Differences (DID) framework to assess how AlphaFold's dataset releases affect the quantity and quality of protein structures solved by structural biologists. Key findings include: (1) A significant substitution effect—the count of completed experimental projects targeting well-predicted structures declined by 66.2% to 90.2% post-release. (2) A quantity-quality tradeoff: AlphaFold's good predictions help structural biologists to solve structures more precisely. (3) A shift in academic impact evaluation standards: projects working on well-predicted proteins, whose structures were never attempted through experiments before are 4% less likely to be published in top journals compared with those who are also first attempts but with poor predictions. While for non-first-attempt projects with good predictions, this likelihood is increased by around 3%. This suggests that AlphaFold's broad coverage may alleviate the pressure of "getting scooped", a dynamic that has been shown to incentivize scientists to prioritize speed over quality in the innovation race. Moreover, AlphaFold accelerated knowledge dissemination, reducing the peer review period for well-predicted structures by approximately 3 months. This paper was awarded the Snavely Prize for Best Summer Paper in UVA and I was invited to attend NBER's Digital Economics and AI Tutorial & Conference, in Spring 2025.

Building on this paper, I am now addressing two unresolved questions. First, I seek to understand the drivers behind the significant substitution effect observed at the project level. Specifically, I am investigating: (1) Who these "missing" structural biologists are, especially in which career stage or trained with which type of experimental methods; (2) Where they go facing the shock brought by AlphaFold. Especially if they are leaving academia to start or join biological firms and how these firms with the flush of scientists perform on the market. Second, I aim to evaluate AlphaFold's impact on downstream commercial applications, particularly how AI technology may affect the efficiency of drug development, and the pace and direction of clinical trials. I believe addressing these questions is critical for understanding how AI influences inequality in scientific discovery and its broader implications for economic growth. I hope my work could also help policymakers design better policies to support innovation and entrepreneurs in today's AI era. Beyond this, I have been actively studying how different regulatory frameworks like copyright and privacy data protection may affect the cost and quality of AI-assisted innovations.

I have actively participated in seminars on entrepreneurship and innovation research, including the Workshop on Entrepreneurial Finance and Innovation (WEFI) and the IFP Economics of Ideas, Science, and Innovation Online PhD Short Course. These experiences have not only inspired me to explore new research ideas but have also reinforced my commitment to this field. If selected, I will deeply appreciate this opportunity and look forward to learning from distinguished faculty and peers while also sharing my own work. I believe this experience will further help me to produce impactful research with broad and lasting social significance throughout my career. Thank you for considering my application.

UNIVERSITY of VIRGINIA
DEPARTMENT OF ECONOMICS

February 14, 2025

To Whom It May Concern,

I am delighted to write this letter in support of Jiarui (Jerry) Qian's application to the NBER Entrepreneurship Research Boot Camp, 2025. I first met Jerry two years ago when he took my econometrics course for first year PhD students, and have been advising him over the last 18 months. Jerry stands out as one of the most promising PhD students at UVA, and I am confident he will make a meaningful contribution to the entrepreneurship research boot camp.

Jerry consistently impresses me with his ability to generate novel research ideas and substantiate them with rigorous empirical analysis. His second-year summer paper, *"AI in the Lab: AlphaFold's Impact on Human-Produced Knowledge,"* examines how AI—specifically AlphaFold—has reshaped scientific knowledge production in structural biology. This is an ambitious and timely project, tackling the long-standing question of whether automation complements or substitutes human expertise. Jerry's research design is particularly clever: leveraging AlphaFold's prediction scores as a treatment variable, he meticulously examines how AI influences the quantity, quality, and evaluation standards of scientific research. His findings are striking: AlphaFold significantly reduces the number of experimental projects completed, while simultaneously enhancing project quality and the peer-review process. This work won the Snavely Prize for Best Second-Year Paper in our department and holds great potential for contributing to the ongoing discussions on AI's role in science and innovation. Alongside this paper, Jerry is developing a broader framework to assess the economic implications of AI-driven scientific advancements.

Jerry is an intellectually curious, analytically rigorous, and highly motivated researcher whose work is both methodologically sound and profoundly relevant. Beyond his strong research abilities, Jerry is an excellent communicator and a keen intellectual contributor. Moreover, Jerry is an active and interdisciplinary learner, consistently seeking knowledge beyond the scope of economics to complement his study. To better understand how AlphaFold impacts scientific research, he conducted several in-depth interviews with faculty in biology and medicine.

I am confident Jerry will be an excellent participant at the boot camp, and I give him my highest recommendation. Please feel free to contact me if you require any further information.

Sincerely,

John Pepper

John Pepper
Merrill S. Bankard Professor of Economics
Chair of the Department of Economics