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December 28, 2025

National Bureau of Economic Research
Innovation Research Boot Camp 2025

Dear Review Committee Members,

I am writing to express my interest in attending NBER's fourth *Innovation Research Boot Camp* in the summer of 2025. I am a third-year economics Ph.D. student at the University of Virginia. My research interests include Innovation, the Economics of Science, Digital Economics, 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 complete list of Ph.D. courses taken.
- 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. Anton Korinek, has kindly agreed to write a recommendation letter on my behalf. Prof. Korinek is well-positioned to attest to my academic abilities, research potential, and commitment to this field. He can be reached via email at akorinek@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

Innovation; the Economics of Science; Digital Economics and AI; 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*

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*

SKILLS

Stata, R, Python, LaTeX, SurveyCTO

A List of PhD-Level Courses Taken

At the University of Virginia

Course Name	Status
ECON 8730 Econometric Methods for Data-Rich Environments	In Progress
LAW 9054 AI and IP	In Progress
ECON 5090 Mathematical Economics I	Completed
ECON 7010 Microeconomic Theory I	Completed
ECON 7030 Microeconomic Theory II	Completed
ECON 8010 Microeconomic Theory III	Completed
ECON 7020 Macroeconomic Theory I	Completed
ECON 7040 Macroeconomic Theory II	Completed
ECON 7710 Econometrics I	Completed
ECON 7720 Econometrics II	Completed
ECON 8170 Industrial Organization I	Completed
ECON 8180 Industrial Organization II	Completed
ECON 8190 Economics of Underdeveloped Areas	Completed
ECON 8510 Topics in Growth Theory	Completed
ECON 8310 Public Economics I	Completed
ECON 8350 Advanced Macroeconomic Theory	Completed
ECON 8360 The Economics of AI	Completed
ECON 8559 Numerical Methods for Economic Analysis	Completed
ECON 8720 Time Series Econometrics	Completed

At the University of Chicago

Course Name	Status
ECON 33530 Firm Dynamics and Economic Growth	Completed
ECON 41001 Behavioral Economics	Completed
ECON 34610 Household Decisions and Markets	Completed
ECON 34901 Social Interactions and Inequality	Completed
ECON 33000 Theory of Income I	Completed
PPHA 44100 Advanced Microeconomics for Policy Analysis I	Completed
PPHA 44200 Advanced Microeconomics for Policy Analysis II	Completed
PPHA 41101 Political Economy I: Introduction to Applied Game Theory	Completed
PPHA 41102 Political Economy II: Intermediate Applied Theory	Completed
PPHA 41103 Political Economy 3: Testing Theories of Political Institutions	Completed
PPHA 42000 Applied Econometrics I	Completed
PPHA 42100 Applied Econometrics II	Completed

My research fields are Innovation, the Economics of Science, Digital Economics, 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) Which fields of science or which type of industry jobs they are switching to facing the shock brought by AlphaFold. 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 in economic growth. I hope my work could also help policymakers design better innovation policies 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.

One year ago, I was fortunate to participate in the *Economics of Ideas, Science, and Innovation* online PhD short course organized by the Institute for Progress (IFP). The lectures and reading groups not only inspired me to explore new research ideas but also strengthened my commitment to studying innovation. If selected, I will deeply value this opportunity and I am eager to learn from the distinguished faculty and peers, share my work, and gain insights that will deepen my understanding of the field. I believe this experience will empower me to continue producing research works, hopefully with a broad and lasting social impact throughout my career. I sincerely appreciate your consideration of my application.

Dear Selection Committee,

I am writing to enthusiastically recommend Jiarui (Jerry) Qian for the NBER Innovation Research Boot Camp 2025. As Jerry's advisor and dissertation committee member at the University of Virginia, I have closely observed his development as a researcher through his coursework and research projects. Jerry stands out for his smarts and for his innovative approach to studying the economics of AI and his rigorous empirical work.

Jerry's research paper, "AI in the Lab: AlphaFold's Impact on Human-Produced Knowledge," exemplifies his ability to identify and analyze cutting-edge questions in innovation economics. His research cleverly exploits AlphaFold's prediction scores to examine how AI affects scientific knowledge production. Using a well-designed difference-in-differences framework, he demonstrates that while AI substitutes for certain types of experimental work, it also enhances research quality and accelerates knowledge dissemination. This work, which won our department's Snavely Prize for Best Second-Year Paper, showcases Jerry's technical capabilities and his talent for addressing fundamental questions about technological change. It is top-5 caliber.

Jerry's broader research agenda demonstrates both depth and breadth in innovation economics. He is currently extending his work to examine how AI affects inequality in scientific discovery and is investigating regulatory frameworks for digital markets, particularly in cloud computing. His interdisciplinary approach is evident in his effort to complement his economics training with coursework in AI and intellectual property law.

The Innovation Research Boot Camp would be an excellent fit for Jerry's

interests and career trajectory. His focused research agenda aligns perfectly with the program's goals. And I am also confident that he would contribute meaningfully to the intellectual discussions at the boot camp.

Best regards,

Anton Korinek
Professor of Economics
University of Virginia