Application for NBER Tutorial on Digital Economics and AI

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Statement of Interest

I am a third-year doctoral candidate in the Technology and Operations Management unit at Harvard Business School (innovation track). And I am writing to express my strong interest in the NBER Tutorial on Digital Economics and AI. My doctoral research, methodological training, and prior work are deeply aligned with the themes of this tutorial, and I promised to be a highly engaged participant.

My research investigates the human and organizational challenges of digital transformation, with a specific focus on the intersection of AI, platforms, and traditional firms. My methodological training includes the core microeconomics and econometrics sequence, as well as "Organizational Economics I and II" and "Machine Learning and Big Data." Most directly relevant to this tutorial is my coursework in "Empirical Innovation and Digitalization" with Professor Shane Greenstein, which deepened my interest in the empirical study of digital markets.

Conceptually, my work is motivated by the idea that AI, digital platforms, and human organizations are three intertwined forces shaping the future of the economy. I am especially interested in how workers and traditional firms respond to the challenges and opportunities created by AI. For example, my qualifying paper, "Training Yourself Out of a Job: The Human–AI Training Paradox," examines a core incentive problem in the digital economy. I adapt a principal–agent model to formalize how workers strategically adjust effort when tasked with training AI systems that may ultimately replace them, and I test the model's predictions through a pre-registered laboratory experiment. This research contributes to three streams of literature: incentives and contracts, human-AI collaboration and automation, training and knowledge transfer.

In related ongoing work, I study how digital innovation by U.S.-listed traditional firms is reflected in financial markets. Specifically, I conduct text analysis of CEO commentary in stock-exchange filings to relate firms' digital initiatives to their subsequent stock-price performance. Together, these projects sit at the nexus of organizational economics, digital transformation, and AI, I think, also precisely the focus of this NBER tutorial.

Beyond my academic work, I have practical experience translating these concepts for a broader audience. I co-authored the book *Smart Rivals: How Innovative Companies Play Games Tech Giants Can't Win* with my advisor, Professor Feng Zhu. The book analyzes how traditional companies can leverage their unique assets to compete and thrive in the digital age, giving me a grounded perspective on the real-world competitive dynamics that digital economics seeks to explain. I have also co-authored a number of HBS cases related to the digital economy. That

includes PDD, China's second-largest e-commerce platform, the digital transformation journey of China's largest hotel chain Huazhu and Sprout Solutions, the biggest SaaS HR platform in the Philippines.

I believe the third year of my PhD is an ideal time to attend this tutorial. I have a clear research direction and active projects, and I am eager to deepen my theoretical and empirical understanding while connecting with leading scholars in this community. The opportunity to subsequently attend the NBER Digital Economics and AI meetings would be an invaluable extension of this learning experience and would help me better situate my dissertation within the broader research frontier. I have regularly attended NBER productivity seminars in Cambridge over the past two years, and I am excited about the prospect of engaging more fully with the NBER digital economics and AI community.

If selected, I commit to 1) Thoroughly preparing all assigned readings and pre-circulated papers; 2) Actively participating in discussions and providing constructive feedback; 3) Engaging with both faculty and fellow participants to build lasting research connections.

Thank you so much for considering my application! I am confident that this tutorial would significantly enhance my research trajectory and enable me to make stronger contributions to the field of digital economics and AI. And I am excited by the prospect of learning from and collaborating with the leaders in digital economics and AI.

Sincerely,

Bonnie Cao