Carnegie Mellon University
HeinzCollege
INFORMATION SYSTEMS • PUBLIC POLICY • MANAGEMENT

Applicant Name: Jiwoo Bae

Contact Information:

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School (Affiliation): Carnegie Mellon University

Program: PhD Information Systems and Managment

Year of Entry: 2024

Expected year of completion: 2029

Faculty Member: Ananya Sen

Area of Interest:

1) Entrepreneurship in technology sector
2) Technological Innovation & Regulation
3) Financial inclusion
4) Social Technology: IoT and Human-Machine Interaction

Jiwoo Bae

jiwoob@andrew.cmu.edu +1 412 909 8702 Pittsburgh, United States of America

Education

Carnegie Mellon University — Pittsburgh, United States
Ph.D. in Information Systems and Management — Sep 2024 —

- Introduction to Machine Learning, Building User-Focused Sensing Systems, Econometric Theory and Methods I, II

London School of Economics and Political Science — London, United Kingdom
MSc Economics — Sep 2021 — July 2022

Korea University — Seoul, Republic of Korea
BA Economics, BA International Studies (Double Major) — Mar 2015 — Feb 2019
Graduation with Great Honors (Overall GPA: $\frac{4.33}{4.5}$)

Fudan University — Shanghai, China
International Summer Session — July 2016

National University of Singapore — Singapore
Semester Exchange — Aug 2017 — Dec 2017

RESEARCH & PROJECTS

"Track your e-waste" Sensor — Carnegie Mellon University
Supervisor: Yugarav Agarwal, Manyak Goel — Feb 2025 —

- IoT-based e-waste sensing and tracking prototype
- Leading the design and integration of an IoT sensor device aimed at raising awareness of an individual's own e-waste inventory.
- Utilized RFID sensors, Raspberry Pi and machine learning model to enhance device efficiency and user experience.

Heart Rate Sensor — Carnegie Mellon University
Supervisor: Justin Harvilla — Oct 2024 –Jan 2025

- Designed and developed an end-to-end prototype for a heart rate sensor using Arduino, 3D printing, and laser cutting.
- Implemented data collection and analysis techniques, integrating real-time data transmission and visualization.

Extended Essay - Contracts and Organisation — London School of Economics and Political Science
Supervisor: Philippe Aghion — Dec 2021 –Jun 2022

- Title: "Information Disclosure and Sequencing: Modelling Virtual Discussion Platforms"
- Explored the effect of sequencing on the aggregation of population information using mathematical modelling of disclosure of two discrete information.
- Enhanced the understanding of dynamics of dissemination and aggregation of information in virtual discussion platforms.

WORK EXPERIENCE

Nethermind — Remote, Republic of Korea
Summer Research Intern — Jun 2024 - Aug 2024

- Spearheaded and founded research agenda intersecting policy and blockchain ecosystem.
- Assisted prompt engineering of smart contract AI tool.
- Propelled the development of intern-wide AI search tool, Netherfind from project management to evaluation.

Bank for International Settlements Basel, Swtizerland
Innovation Hub, Switzerland Centre - Associate Oct 2022 - Aug 2023

- Spearheaded research and development of Automated Market Maker FX simulations using CBDCs paving a path for the potential future of tokenised central bank money in FX.
- Led the literature review of decentralised finance application between three Central Banks, Schweizerische Nationalbank, Monetary Authority of Singapore, Banque de France.
- Successfully developed and deployed the introduction of futures into real-time FX monitoring product Rio, deeply enhancing the experience for 7 central bank FX teams.
- Led the orchestration and transformation of 20 million payments for simulation and testing of retail CBDC payments resulting in a distinctive "battle-tested" instant payment prototype
- Contributed to key strategic insights by producing and delivering data driven analysis to crucial stakeholders enabling prudent decision making by C-Suite level executives.
- Piloted innovative data schemas and manipulation scripts using Databricks, R, and Kafka to deliver real time analytics and graphic illustrations enriching data visualisations.

QUALIFICATION & SKILLS

- **Natural Language**
  Korean (Native), English (Near-Native Fluency), Mandarin (Intermediate), German (Beginner), French (Beginner)
- **Software** Python(Pandas, Scikit-Learn), R, SQL
- **Embedded Systems** & **Hardware** Arduino (C/C++), Raspberry Pi, 3D printing (Fusion 360), laser cutting
- **Tools, Framework, Database** Git, Apache Spark, PostgreSQL
- **Soft skills** Collaborative, Interdisciplinary teamwork
- **Scrum Master** Certified ScrumMaster (ScrumAlliance, April 2023)
- **Hobby** Tennis, Bass guitar

Research Statement

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My unique experience working at an internal technology-policy think tank of an international financial institution exposed me to the process of innovating new projects and tapping into one's entrepreneurial mindset. I continued to build on this experience working at a startup positioned as a market expander in the blockchain space. These experiences altogether guide my research interest in entrepreneurship. I aim to develop and explore some of the ideas laid out below in current and future dates.

Many of my questions relate to the *lifecycle and processes* of entrepreneurial ventures in technology. I am intrigued by finding the root of the entrepreneurship mindset and examining key factors (if any) of successes and failures of entrepreneurship ventures. I am interested to find out how to harness innovation processes such as "design thinking" to grow entrepreneurial mindsets of individuals and society. In addition, I wish to explore the diffusion of entrepreneurial endeavors and to understand the timeliness of such mindset. Besides this, I am interested in the role of innovation/entrepreneurial mindset in the public sector and macroeconomic policies of countries, the relationship of entrepreneurship models with technological booms and busts and enhancing financial opportunity and inclusivity questions in entrepreneurial successes.

In addition to my interest in entrepreneurship, my research interest lies in human-machine interaction, where I aim to explore the nature of how humans interact with digital machines. I believe that technology should be designed to empower and free humans. In my future research, I wish to take a hands-on approach to entrepreneurship in combination with this research agenda. An example I wish to answer is in examining various technological innovations/ventures that start out as research and transfer into the market. Carnegie Mellon University's unique position as a university with various technological ventures will be a great space to do survey and empirical research to understand the flow of technological innovations and entrepreneurship from research to industry markets.

Overall, my research focuses on answering the role of entrepreneurship in today's technological driven world, and how entrepreneurship can aid technological innovations that benefit humanity. NBER's 2025 Entrepreneurship Research Boot Camp will be an opportunity for me to build, bridge and execute the research questions I have laid out above. While accelerating and exposing me to the breadth and depth of latest entrepreneurship research, I am excited to scope out and formulate specific questions from innovation/entrepreneurial mindset in the public sector to role of entrepreneurship in the technology innovations. Most importantly, I am excited to meet and converse with various experts in entrepreneurship research and build lasting connections.

Ananya Sen

Associate Professor

Heinz College of Information Systems and Public Policy

Carnegie Mellon University

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February 14th, 2024

To whom it may concern,

I strongly recommend Ms. Bae, for the NBER 2025 Entrepreneurship Research Boot Camp. I have had the privilege of working with Ms. Bae as her advisor from September 2024 at Heinz College, Carnegie Mellon University. I have no doubt she will be a great addition to your bootcamp. Over the past few months, Ms. Bae has demonstrated an enthusiasm to discover key research areas for her dissertation. She is smart, thoughtful, hardworking, and sincere which are qualities needed for an outstanding doctoral candidate. I believe her inquisitive mind, collaborative attitude and the desire to bridge research of various fields will strengthen the bootcamp.

Jiwoo is completing her first year of PhD, with interests at the intersection of technology and entrepreneurship research. Through our conversations it is evident that this bootcamp will propel and expedite her exposure into this field but also provide an opportunity for her to get to know this vibrant community. I have no doubt her breadth of knowledge and experience adjacent to entrepreneurship will bring fruitful conversations to this research community.

I wholeheartedly recommend Ms. Bae for this boot camp. Please do not hesitate to reach out to me if you have any questions about Ms. Bae's aptitude and character.



Sincerely,

Ananya Sen