# Application for NBER PhD Workshop in Economics of AI

May 19th, 2020

- Contact information (this page), CV, and research summary (in order)

Sukhun Kang
Doctoral Student
London Business School
London, United Kingdom
skang@london.edu
+82 10 7226 8312

# Sukhun Kang

Regent's Park, London, NW1 4SA, United Kingdom
Phone: +82(0)10 7226 8312 | Email: skang@london.edu


## EDUCATION

**London Business School,** Ph.D. in Strategy and Entrepreneurship — Expected 2023
**University of Southern California**, MS in Entrepreneurship & Innovation and Computer Engeenering — 2016
**University of Illinois at Urbana-Champaign**, BS in Computer Engineering — 2007

## RESEARCH INTERESTS

Entrepreneurship and Innovation; Strategic Management; Business and Public Policy

## PHD COURSES

*Core Topics:* Basic Readings in Business; Core Strategy; Behavioral Foundations of Strategy; Economic Foundations of Strategy; Entrepreneurship and Innovation; Sociological Foundation Strategy
*Research Methods:* Econometrics I; Statistical Methods II; Research Design
*Additional Courses:* Foundations of Business Research; Microeconomics; OB Team
*Audited Courses:* Labour Economics for Research Students (LSE); Survey Methodology (LSE); Causal Inference for Observational and Experiential Studies (LSE)

## PEER-REVIEWED PUBLICATION

Yong Paik, Sukhun Kang, and Robert Seamans. 2019. "Entrepreneurship, Innovation, and Political Competition: How the Public Sector Helps the Sharing Economy Create Value" ***Strategic Management Journal***, 40: 503-532.

## WORK IN PROGRESS

"Orchestrating an Ecosystem: A Temporal Study of Orchestrator's Ex-Ante Intentions, Ex-post Actions, and Ultimate Performance" (with Gary Dushnitsky)

"Entrepreneurship and Informal Institutions: Evidence from the First Female President Elected in Korea" (with Olenka Kacperczyk and Yongwook Paik)

"The Differential Effect of Public Scientific Information on Innovation: Evidence from The Cancer Genome Atlas"

## WORKSHOPS

NBER Entrepreneurship Research Bootcamp — 2019
West Coast Research Symposium on Technology Entrepreneurship Doctoral Student Workshop — 2018
Korean Advanced Institute of Science of Technology Workshop on Research Methodology — 2017
Northwestern-Duke Workshop on Research Design for Causal Inference — 2016

## GRANTS AND FELLOWSHIPS

Institute of Entrepreneurship and Innovation Research Grant, LBS — 2019, 2020
Wheeler Institute for Business and Development Research Grant, LBS — 2019
Fellowship for Doctoral Students, LBS — 2016-Present

## INDUSTRY EXPERIENCE

**Primer Accelerator**, *Intern*, Los Angeles, USA — Summer 2016
**City of Glendale**, *MBA Intern*, Glendale, USA — Spring 2015
**Samsung Electronics**, *Engineer*, Yong-In, South Korea — 2012-2014
**I&C Technology**, *Research Engineer*, Seoul, South Korea — 2010-2012
**Egghead**, *Founder*, Seoul, South Korea — 2010

## RESEARCH SUMMARY

My interest in AI stems from my interest in studying the economics of entrepreneurship and innovation. I have sought to be at the forefront of investigating the types of institutions and factors that promote entrepreneurship and innovation. One particular setting that I have been examining is the pharmaceutical industry.

One of my projects examines the effect of public scientific information on innovation. From 2011 to 2018, The Cancer Genome Atlas (TCGA) characterized over 20,000 primary cancers and matched normal samples of 33 different cancer types. When the mapping was completed, the genomic analyses were posted on a public repository. In my paper, I find that TCGA completion disproportionately increases early-stage drug development by private companies while increasing both early and late-stage drug development by public companies. While the view from the top looks like scientists at pharmaceutical companies could be simply using the published scientific information, the closer looks reveal how artificial intelligence is reshaping the drug discovery and development.

In the biopharmaceutical industry, AI is affecting many aspects of drug development. First, as TCGA, many scientists are using AI to shed light on the genetic mutation of diseases by analyzing the difference between affected tissues and normal tissues. This can lead to a much faster and more efficient identification of novel targets. Second, AI can help in predicting the effect of an existing chemical molecule by analyzing its structure. With deep-learning, scientists at MIT were recently able to identify a novel antibiotic that had a broad-spectrum mechanism that was a first-in-class (Stokes et al., 2020). These advances can potentially increase productivity in drug development and help lowering drug prices (DiMasi, Grabowski, & Hansen, 2016; Pammolli, Magazzini, & Riccaboni, 2011). With my research, I hope to shed light on how AI affects the productivity of the biopharmaceutical industry.

## REFERENCES

DiMasi, J. A., Grabowski, H. G., & Hansen, R. W. 2016. Innovation in the pharmaceutical industry: New estimates of R&D costs. ***Journal of Health Economics***, 47: 20–33.

Pammolli, F., Magazzini, L., & Riccaboni, M. 2011. The productivity crisis in pharmaceutical R&D. ***Nature Reviews Drug Discovery***, 10(6): 428.

Stokes, J. M., Yang, K., Swanson, K., Jin, W., Cubillos-Ruiz, A., et al. 2020. A Deep Learning Approach to Antibiotic Discovery. ***Cell***, 180(4): 688-702.e13.