Inho Hong

Postdoctoral Research Fellow
Center for Humans and Machines
Max Planck Institute for Human Development
Lentzeallee 94, Berlin 14195, Germany

hong@mpib-berlin.mpg.de
ihong4867@gmail.com
Webpage: inhohong.github.io

Education

Ph.D. in Physics, POSTECH, Pohang, Korea — 2013.03 - 2019.08
- Thesis: Complexity and Scaling in Cities
- Advisor: Woo-Sung Jung (Complexity in Social System Lab)

M.S. in Physics, POSTECH, Pohang, Korea — 2010.03 - 2012.02
- Advisor: Hyeon K. Park

B.S. in Physics, POSTECH, Pohang, Korea — 2006.03 - 2010.02

Position

Max Planck Institute for Human Development, Berlin, Germany — 2020.03 - present
Postdoctoral Research Fellow
- Center for Humans and Machines (Director: Iyad Rahwan)
- Machines and the Future of Work Group (PI: Alex Rutherford)

Seoul Institute of Technology, Seoul, Korea — 2020.08 - present
Visiting Researcher

Asia Pacific Center for Theoretical Physics, Pohang, Korea — 2019.09 - 2020.02
Postdoctoral Research Fellow
- Statistical Physics of Complex Dynamics Lab (Leader: Hang-Hyun Jo)

Kellogg School of Management, Northwestern University, USA — 2017.10 - 2018.08
Northwestern Institute on Complex Systems, USA
Visiting Predoctoral Fellow (Host: Hyejin Youn)

Interest

Social mobilization
Social networks, polarized mobilization, social influence, open challenges.

Future of work
Product (industry) space, innovation, occupation and skill, employment, revealed comparative advantage.

Science of cities
Urban scaling, urban economy, intracity mobility, population distribution, urban recapitulation, universality.

Human mobility

Gravity model, radiation model, numerical simulation, transportation network, migration.

Science of science
Knowledge space, topic modelling, citation network, collaboration network, bibliometric dataset.

Visiting

Institute for Basic Science, Korea 2020.02
Data Science Group (Chief Investigator: Meeyoung Cha)

Harvard Kennedy School, Harvard University, USA 2017.06
Growth Lab (Director: Ricardo Hausmann), Center for International Development

Santa Fe Institute, USA 2016.02
Graduate Studies Program

Aalto University, Finland 2015.02
Department of Biomedical Engineering and Computational Science

---

Teaching

Department of Physics, POSTECH

Teaching assistant, Analytical Mechanics	Spring 2013
Teaching assistant, Electrodynamics I	Spring 2011
Teaching assistant, Electronics & Instrumentation Lab	Fall 2010
Teaching assistant, Electronics & Instrumentation Lab	Spring 2010

Project

Physicia upgrade
Upgrade and develop educational software "Physicia" for demonstrating simulations on statistical physics and nonlinear dynamics [LINK]. 2016.03 - 2016.09

Honor

Global Ph.D. Fellowship Program
National Research Foundation of Korea (NRF) (USD 25,000/yr). 2014.03 - 2017.02

Samsung Undergraduate Scholarship 2006.03 - 2010.02

Excellent Poster Presentation Award

2017 Korean Physical Society Spring Meeting	2017.04
2013 Korean Physical Society Fall Meeting	2013.10

Excellent Oral Presentation Award
2016 Korean Physical Society Fall Meeting 2016.10

Excellent Teaching Assistant Award

Electronics & Instrumentation Lab, Dept. of Physics, POSTECH	Fall 2010
Electronics & Instrumentation Lab, Dept. of Physics, POSTECH	Spring 2010

Best Paper Award
Undergraduate Research Program, POSTECH 2010.02

Excellent Bachelor Thesis Award
Department of Physics, POSTECH 2009.11

Article

"Open data and COVID-19: Wikipedia as an informational resource during the pandemic", *Medium*, Apr 16, 2020.

"Open data and COVID-19: Language diversity on Wikipedia", *Medium*, May 14, 2020.

Preprint

A. Rutherford, M. Cebrian, **I. Hong** and I. Rahwan, "Impossible by Conventional Means: Ten Years on from the DARPA Red Balloon Challenge", *arXiv preprint arXiv:2008.05940*.

Publication

I. Hong, M. R. Frank, I. Rahwan, W.-S. Jung and H. Youn, "The universal pathway to innovative urban economies", *Science Advances* **6**, eaba4934 (2020). [arXiv].
- **Media coverage**: Quartz, Fast Company, Northwestern NOW and Maeil Business Newspaper (in Korean).

I. Hong, W.-S. Jung and H.-H. Jo, "Gravity model explained by the radiation model on a population landscape", *PLoS ONE* 14, e0218028 (2019).

H. Kim[†], **I. Hong**[†] and W.-S. Jung, "Measuring national capability over big science's multidisciplinarity: A case study of nuclear fusion research", *PLoS ONE* 14, e0211963 (2019).
- [†]*Equally contributed*

I. Hong and W.-S. Jung, "Application of gravity model on the Korean urban bus network", *Physica A* 462, 48-55 (2016).

S. Lee, **I. Hong**, W.-S. Jung, "A network approach to the transfer market of European football leagues", *New Physics: Sae Mulli* 65, 402-409 (2015).

I. Hong *et al.*, "Evaluation of the imaging properties of Microwave Imaging Reflectometry", *Journal of Instrumentation* 7, C01077 (2012).

W. Lee *et al.*, "Microwave imaging reflectometry system for KSTAR", *Plasma and Fusion Research* 6, 2402037-2402037 (2011).

W. Lee *et al.*, "Comparative study between the reflective optics and lens based system for microwave imaging system on KSTAR", *Review of Scientific Instruments* 81, 10D932 (2010).

H. K. Park *et al.*, "Microwave imaging reflectometry studies for turbulence diagnostics on KSTAR", *Review of Scientific Instruments* 81, 10D933 (2010).

Oral talk

A. Rutherford, M. Cebrian, **I. Hong**, Iyad Rahwan, "Social mobilization impeded by political polarization", *NetSci 2020*, Sep 21-25, 2020.

I. Hong, A. Rutherford, L. N. Ferreira, M. Cebrian, "Epidemic-driven conflict and conflict-driven epidemics", *NetSci 2020*, Sep 21-25, 2020.

T. You, O.-H. Kwon, **I. Hong**, W.-S. Jung, "Alliance structure between UN Security Council members from debates", *NetSci 2020*, Sep 21-25, 2020.

I. Hong *et al.*, "Urban economies recapitulate a common trajectory", *4th Annual International Conference on Computational Social Science*, Jul 12-15, 2018.

I. Hong, W.-S. Jung and H. Youn, "Who is the shepherd? Small city follows trajectory of larger cities in their economic compositions", *Conference on Complex Systems 2017*, Sep 17-22, 2017.

I. Hong, W.-S. Jung and H. Youn, "Small city follows larger city's trajectory in urban economy", *The 19th Workshop for Statistical Physics*, Aug 28-30, 2017.

I. Hong, W.-S. Jung and H. Youn, "Structural change in urban industry", *APCTP 2016 Workshop on Frontiers of Physics: Push the Envelope of Statistical Physics: Econo, Social, Bio and Beyond*, Dec 14, 2016.

I. Hong, W.-S. Jung and H. Youn, "Structural change in urban economy through creative destruction", *DISC 2016*, Dec 9, 2016.

I. Hong, H. Kim and W.-S. Jung, "Knowledge Structure of Nuclear Fusion Research", *2016 Korean Physical Society Fall Meeting* (**Excellent Oral Presentation Award**), Oct 20, 2016.

H. Kim, **I. Hong** and W.-S. Jung, "Fusion of nations, fusion of disciplines: network evolution in nuclear fusion research", *2016 Conference on Complex Systems*, Sep 20, 2016.

I. Hong, W.-S. Jung and H. Youn, "Creative destruction in urban economy: industrial trajectory in time and space", *NetSci 2016 Satellite Meeting, May 30*, 2016.

I. Hong *et al.*, "Industrial Dynamics in Urban Areas", *Application of Econophysics and Social Physics: Winter Workshop*, Feb 22-23, 2016.

I. Hong and W.-S. Jung, "Gravity and Radiation Models for the Korean Bus Network", *Physics of Social Complexity Workshop*, Nov 2-4, 2015.

I. Hong and W.-S. Jung, "Gravity and Radiation Models for Intra-Urban Mobility by the Korean Urban Bus System", *The 18th Workshop for Statistical Physics*, Aug 21, 2015.

I. Hong and W.-S. Jung, "Application of the Gravity and Radiation Models on the Korean Urban Bus Network", *2015 Korean Physical Society Spring Meeting*, Apr 22, 2015.

I. Hong and W.-S. Jung, "Statistical Analysis and Modeling of the Korean Urban Bus Network", *Social Modeling and Simulations + Econophysics Colloquium 2014*, Nov 4, 2014.

I. Hong and W.-S. Jung, "Network Analysis of the Urban Bus System in Korea", *Application of Econophysics and Social Physics: Summer Workshop*, Aug 22, 2014.

I. Hong, W.-S. Jung, "Intra-City Bus Network Analysis on the Korean Cities for Understanding Urban Structures", *The 17th Workshop for Statistical Physics*, Nov 2, 2013.

I. Hong and W.-S. Jung, "Intra-city Bus Network in Korean Mid-size Cities", *Econophysics Colloquium 2013 & Asia Pacific Econophysics Conference 2013*, Jul 30, 2013.

Poster

I. Hong *et al.*, "Cities recapitulate a universal pathway to innovative economies", *NetSci-X 2020*, Jan 20-23, 2020.

I. Hong, W.-S. Jung and H.-H. Jo, "Unifying Framework of Mobility Models on Population Landscape", *2017 Korean Physical Society Spring Meeting* (**Excellent Poster Presentation Award**), Apr 19-21, 2017.

I. Hong, W.-S. Jung, "Comparison of Traffic Models for the Korean Bus System", *2015 Korean Physical Society Fall Meeting*, Oct 22, 2015.

I. Hong and W.-S. Jung, "Network Modeling of the Korean Urban Bus Network", *2014 Korean Physical Society Fall Meeting*, Oct 23, 2014.

B.-H. Lee, **I. Hong** and W.-S. Jung, "Complex Network Analysis of the Korean Transportation Network", *The 15th Asia Pacific Industrial Engineering and Management Systems Conference*, Oct 12-15, 2014.

B.-H. Lee *et al.*, "Statistical Properties of the Korean Transportation Network as a Complex Network", *European Conference on Complex Systems '14*, Sep 23, 2014.

I. Hong and W.-S. Jung, "Intra-City Bus Network Analysis on the Korean Cities for Understanding Urban Structures", *Korean Physical Society 2013 Fall Meeting* (**Excellent Poster Presentation Award**), Oct 31, 2013.

I. Hong, "Investigation on Intra-city Bus Network in Cheongju", *The 5th International Symposium on IT Convergence Engineering*, Jul 11-12, 2013.
