Inho Hong

Postdoctoral Research Fellow, **Center for Humans and Machines**
Max Planck Institute for Human Development
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Education

Ph.D. in Physics, POSTECH, 2019.
- Thesis: Complexity and Scaling in Cities
- Advisor: Woo-Sung Jung

M.S. in Physics, POSTECH, 2012.
- Advisor: Hyeon K. Park

B.S. in Physics, POSTECH, 2010.

Positions

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 - 2020.12
Visiting Researcher

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

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

Visiting research

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)

Santa Fe Institute, USA — 2016.02
Graduate Studies Program

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

Teaching experience

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

Honors

Awards

Young Statistical Physicist Award, The Korean Physical Society [News]. 2021.04
Best Paper Award, Korea Computer Congress. 2021.06
Excellent Poster Presentation Award, The Korean Physical Society. 2017.04
Excellent Oral Presentation Award, The Korean Physical Society. 2016.10
Excellent Poster Presentation Award, The Korean Physical Society. 2013.10
Excellent Teaching Assistant Award, Dept. of Physics, POSTECH. Fall 2010
Excellent Teaching Assistant Award, Dept. of Physics, POSTECH. Spring 2010
Best Paper Award, Undergraduate Research Program, POSTECH. 2010.02
Excellent Bachelor Thesis Award, Dept. of Physics, POSTECH. 2009.11

Fellowships

Global Ph.D. Fellowship, National Research Foundation of Korea. 2014.03 - 2017.02
- Principal Investigator, 90,000,000 KRW in total.

Samsung Undergraduate Scholarship. 2006.03 - 2010.02

Articles

1. **I. Hong** and H. Youn, "Universality in Urban Growth" (in Korean), 물리학과 첨단기술 (Webzine published by the Korean Physical Society), May 11, 2021. https://doi.org/10.3938/PhiT.30.011
2. D. Sáez-Trumper *et al*., "Open data and COVID-19: Wikipedia as an informational resource during the pandemic", *Medium*, Apr 16, 2020 [LINK].
3. D. Sáez-Trumper *et al*., "Open data and COVID-19: Language diversity on Wikipedia", *Medium*, May 14, 2020 [LINK].

Media coverage

- **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).
  Featured in Forbes, Quartz, Fast Company, Northwestern Magazine, Northwestern Now, and Maeil Business Newspaper (in Korean).
- **I. Hong**[†], A. Rutherford, and M. Cebrian, "Social mobilization and polarization can create volatility in COVID-19 pandemic control", *Applied Network Science* 6, 1 (2021). [†]Corresponding author.
  Featured in Max-Planck-Gesellschaft, IDW Online, Heise Online, Berliner Zeitung,, and Deutschlandfunk.
- O.-H. Kwon[*], **I. Hong**[*], J. Yang, D. Y. Wohn, W.-S. Jung, and M. Cha, "Urban green space and happiness in developed countries", *EPJ Data Science*, 10, 28 (2021). [*]Equally contributed.
  Featured in Phys.org, Science Daily, The Science Times, Joongang Ilbo, Yeonhap News, Kyunghyang Shinmun, and more.

Services

Peer review for journals

Scientific Reports, PLoS One, Complexity, Physica A, Socio-Economic Planning Sciences.

Journal publications

Google Scholar: https://scholar.google.com/citations?user=kmN6l-AAAAAJ
[†]Corresponding author. [*]Equally contributed.

1. L. N. Ferreira, **I. Hong**, A. Rutherford, and M. Cebrian, "The small-world network of global protests", *Scientific Reports* 11, 19215 (2021).
   https://doi.org/10.1038/s41598-021-98628-y

2. O.-H. Kwon*, **I. Hong***, J. Yang, D. Y. Wohn, W.-S. Jung, and M. Cha, "Urban green space and happiness in developed countries", *EPJ Data Science*, 10, 28 (2021).
https://doi.org/10.1140/epjds/s13688-021-00278-7

3. **I. Hong**†, A. Rutherford, and M. Cebrian, "Social mobilization and polarization can create volatility in COVID-19 pandemic control", *Applied Network Science* 6, 1 (2021).
https://doi.org/10.1007/s41109-021-00356-9

4. **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).
https://doi.org/10.1126/sciadv.aba4934

5. **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).
https://doi.org/10.1371/journal.pone.0218028

6. 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).
https://doi.org/10.1371/journal.pone.0211963

7. **I. Hong** and W.-S. Jung, "Application of gravity model on the Korean urban bus network", *Physica A: Statistical Mechanics and its Applications* 462, 48-55 (2016).
https://doi.org/10.1016/j.physa.2016.06.055

8. S. Lee, **I. Hong**, and W.-S. Jung, "A network approach to the transfer market of European football leagues", *New Physics: Sae Mulli* 65, 402-409 (2015).
https://doi.org/10.3938/NPSM.65.402

9. **I. Hong**†, W. Lee, J. Leem, Y. Nam, M. Kim, G. S. Yun, H. K. Park, C. W. Domier, and N. C. Luhmann Jr., "Evaluation of the imaging properties of Microwave Imaging Reflectometry", *Journal of Instrumentation* 7, C01077 (2012).
https://doi.org/10.1088/1748-0221/7/01/C01077

10. W. Lee, **I. Hong**, J. Leem, M. Kim, Y. Nam, G. S. Yun, H. K. Park, Y. G. Kim, K. W. Kim, C. W. Domier, and N. C. Luhmann Jr., "Microwave imaging reflectometry for KSTAR", *Journal of Instrumentation* 7, C01070 (2012).
https://doi.org/10.1088/1748-0221/7/01/C01070

11. W. Lee, G. S. Yun, **I. Hong**, M. Kim, J. B. Kim, Y. Nam, H. K. Park, Y. G. Kim, K. W. Kim, B. Tobias, C. W. Domier, and N. C. Luhmann Jr., "Microwave imaging reflectometry system for KSTAR", *Plasma and Fusion Research* 6, 2402037-2402037 (2011).
https://doi.org/10.1585/pfr.6.2402037

12. W. Lee, G. S. Yun, Y. Nam, **I. Hong**, J. B. Kim, H. K. Park, B. Tobias, T. Liang, C. W. Domier, and N. C. Luhmann Jr., "Comparative study between the reflective optics and lens based system for microwave imaging system on KSTAR", *Review of Scientific Instruments* 81, 10D932 (2010).
https://doi.org/10.1063/1.3491189

13. H. K. Park, **I. Hong**, M. Kim, G. S. Yun, W. Lee, J. Kim, B. Tobias, C. W. Domier, N. C. Luhmann Jr., and K. W. Kim, "Microwave imaging reflectometry studies for turbulence diagnostics on KSTAR", *Review of Scientific Instruments* 81, 10D933 (2010).
https://doi.org/10.1063/1.3499606

CONFERENCE PROCEEDINGS

1. C. Jung, **I. Hong**, D. Sáez-Trumper, D. Lee, J. Myung, D. Kim, J. Yun, W.-S. Jung, and M. Cha, "Information flow on COVID-19 over Wikipedia: A case study of 11 languages", *Companion Proceedings of the Web Conference 2021*, pp. 627 (2021). https://doi.org/10.1145/3442442.3452352

List of Presentations

INVITED TALKS

1. **I. Hong**, "Complex interplay between socio-spatial components of cities", *2021 Korean Physical Society Fall Meeting*, Oct 20, 2021 **(Young Statistical Physicist Award Lecture)**.
2. **I. Hong**, "The universal pathway to innovative urban economies", *Application of Econophysics and Social Physics*, Aug 10, 2021.
3. **I. Hong**, "The universal pathway to innovative urban economies", *National Institute for Mathematical Sciences*, Jul 09, 2021.
4. **I. Hong**, "The universal pathway to innovative urban economies", *Northwestern Institute on Complex Systems*, Aug 14, 2020.
5. **I. Hong**, "The universal pathway to innovative urban economies", *Growth Lab at Harvard Kennedy School*, Aug 10, 2020.
6. **I. Hong**, "Complexity and scaling in urban economies", *Seoul Institute of Technology*, Feb 21, 2020.

ORAL TALKS

1. **I. Hong**, L. N. Ferreira, A. Rutherford, and M. Cebrian, "Protest-driven epidemics during the COVID-19 pandemic", *Complex Networks 2021*, Dec 1, 2021.
2. **I. Hong**, L. N. Ferreira, A. Rutherford, and M. Cebrian, "Epidemic-driven protests and protest-driven epidemics", *7th International Conference on Computational Social Science (IC2S2)*, Jul 30, 2021.
3. **I. Hong**, L. N. Ferreira, A. Rutherford, and M. Cebrian, "Interplay of protests and epidemics during the COVID-19 pandemic", *Networks 2021*, Jul 10, 2021.
4. L. N. Ferreira, **I. Hong**, A. Rutherford, and M. Cebrian, "The small-world network of protests", *Networks 2021*, Jul 9, 2021.
5. D. Kim, D. Lee, J. Myung, C. Jung, **I. Hong**, D. Sáez-Trumper, J. Yun, W.-S. Jung, M. Cha, "Information structure analysis of COVID-19 pandemic using Wikipedia data", *Korea Computer Congress 2021*, Jun 23, 2021 (**Best Paper Award**).
6. **I. Hong**, A. Rutherford, and M. Cebrian, "Polarized social mobilization for pandemic control", *2021 Korean Physical Society Spring Meeting*, Apr 22, 2021.
7. **I. Hong**, A. Rutherford, L. N. Ferreira, and M. Cebrian, "Epidemic-driven conflict and conflict-driven epidemics", *Complex Networks 2020*, Dec 2, 2020.
8. A. Rutherford, M. Cebrian, **I. Hong**, and I. Rahwan, "Social mobilization impeded by political polarization", *NetSci 2020*, Sep 25, 2020.
9. **I. Hong**, A. Rutherford, L. N. Ferreira, and M. Cebrian, "Epidemic-driven conflict and conflict-driven epidemics", *NetSci 2020*, Sep 23, 2020.
10. T. You, O.-H. Kwon, **I. Hong**, and W.-S. Jung, "Alliance structure between UN Security Council members from debates", *NetSci 2020*, Sep 22, 2020.
11. **I. Hong**, M. R. Frank, I. Rahwan, W.-S. Jung, and H. Youn, "Urban economies recapitulate a common trajectory", *4th Annual International Conference on Computational Social Science (IC2S2)*, Jul 14, 2018.

12. **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, 2017.

13. **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.

14. **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.

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

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

17. 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.

18. **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.

19. **I. Hong**, W.-S. Jung, and H. Youn, "Industrial Dynamics in Urban Areas", *Application of Econophysics and Social Physics: Winter Workshop*, Feb 22-23, 2016.

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

21. **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.

22. **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.

23. **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.

24. **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.

25. **I. Hong** and 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.

26. **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.

POSTERS

1. **I. Hong**, M. Kwon, J. Kim, S. Na, and W.-S. Jung, "Urban scaling and transition in Korean economy", *2020 Korean Physical Society Fall Meeting*, Nov 5, 2020.

2. O.-H. Kwon, **I. Hong**, W.-S. Jung, and H.-H. Jo, "Explaining the varying exponent of gravity model on urban landscapes", *2020 Korean Physical Society Fall Meeting*, Nov 5, 2020.

3. **I. Hong**, M. R. Frank, I. Rahwan, W.-S. Jung, and H. Youn, "Cities recapitulate a universal pathway to innovative economies", *NetSci-X 2020*, Jan 21, 2020.

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

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

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

7. 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.

8. B.-H. Lee, **I. Hong**, W.-S. Jung, and O. Kwon, "Statistical Properties of the Korean Transportation Network as a Complex Network", *European Conference on Complex Systems '14*, Sep 23, 2014.

9. **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*, Oct 31, 2013 (**Excellent Poster Presentation Award**).

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