

Jincheol Park

Department of Earth and Atmospheric Sciences
University of Houston, Houston, Texas, USA
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Education

- PhD candidate, PhD program in Atmospheric Sciences 2020 - Present
University of Houston, Houston, Texas, USA
Supervisor: Dr. Yunsoo Choi
Dissertation: Employment of multi-source satellite-based observations in air quality modeling over Asia
- Master of Science, Environmental Science 2017 - 2019
University of Texas at San Antonio, San Antonio, Texas, USA
Supervisor: Dr. Janis K. Bush
Thesis: Impacts of prevailing winds on monarch butterflies' migratory patterns along overnight roosts in Texas
- Bachelor of Science, Environmental Science 2009 - 2013
University of Texas at San Antonio, San Antonio, Texas, USA

Publications

- Khorshidian, N., Choi, Y., Mousavinezhad, S., Pouyaei, A., **Park, J.**, & Fan, J. (2024). Comparing the interactions between particulate matter and cloud properties over two populated cities in Texas using WRF-Chem fine-resolution modeling. *Atmospheric Environment*, 338, 120795. <https://doi.org/10.1016/j.atmosenv.2024.120795>
- Dimri, R., Choi, Y., Salman, A. K., **Park, J.**, & Singh, D. (2024). AGATNet: An Adaptive Graph Attention Network for Bias Correction of CMAQ-Forecasted PM_{2.5} Concentrations Over South Korea. *Journal of Geophysical Research: Machine Learning and Computation*, 1(3), e2024JH000244. <https://doi.org/10.1029/2024JH000244>
- Shams, S. R., Choi, Y., Singh, D., Ghahremanloo, M., Momeni, M., & **Park, J.** (2024). Innovative approaches for accurate ozone prediction and health risk analysis in South Korea: The combined effectiveness of deep learning and AirQ+. *Science of The Total Environment*, 946, 174158. <https://doi.org/10.1016/j.scitotenv.2024.174158>
- Kashfi Yeganeh, A., Momeni, M., Choi, Y., **Park, J.**, & Jung, J. (2024). A case study of surface ozone source contributions in the Seoul metropolitan area using the adjoint of CMAQ. *Journal of the Air & Waste Management Association*, 74(7), 511–530. <https://doi.org/10.1080/10962247.2024.2361021>
- Park, J.**, Choi, Y., Jung, J., Lee, K., & Yeganeh, A. K. (2024). First Top-Down Diurnal Updates to NO_x Emissions Inventory in Asia Informed by the Geostationary Environment Monitoring Spectrometer (GEMS) Tropospheric NO₂ Columns. Preprint (Scientific Reports). <https://doi.org/10.21203/rs.3.rs-4283240/v1>
- Payami, M., Choi, Y., Salman, A. K., Mousavinezhad, S., **Park, J.**, & Pouyaei, A. (2024). A 1D CNN-based emulator of CMAQ: Predicting NO₂ concentration over the most populated urban regions in Texas. *Artificial Intelligence for the Earth Systems*, 1(aop). <https://doi.org/10.1175/AIES-D-23-0055.1>
- Momeni, M., Choi, Y., Kashfi Yeganeh, A., Pouyaei, A., Jung, J., **Park, J.**, Shephard, M. W., Dammers, E., & Cady-Pereira, K. E. (2024). Constraining East Asia ammonia emissions through satellite observations and iterative Finite Difference Mass Balance (iFDMB) and investigating its impact on inorganic fine particulate matter. *Environment International*, 184, 108473. <https://doi.org/10.1016/j.envint.2024.108473>
- Singh, D., Choi, Y., **Park, J.**, Salman, A. K., Sayeed, A., & Song, C. H. (2024). Deep-BCSI: A deep learning-based framework for bias correction and spatial imputation of PM_{2.5} concentrations in South Korea. *Atmospheric Research*, 301, 107283. <https://doi.org/10.1016/j.atmosres.2024.107283>

- Salman, A. K., Choi, Y., **Park, J.**, Mousavinezhad, S., Payami, M., Momeni, M., & Ghahremanloo, M. (2024). Deep learning based emulator for simulating CMAQ surface NO₂ levels over the CONUS. *Atmospheric Environment*, 316, 120192. <https://doi.org/10.1016/j.atmosenv.2023.120192>
- Nelson, D., Choi, Y., Sadeghi, B., Yeganeh, A. K., Ghahremanloo, M., & **Park, J.** (2023). A comprehensive approach combining positive matrix factorization modeling, meteorology, and machine learning for source apportionment of surface ozone precursors: Underlying factors contributing to ozone formation in Houston, Texas. *Environmental Pollution*, 334, 122223. <https://doi.org/10.1016/j.envpol.2023.122223>
- Zanganeh Kia, H., Choi, Y., Nelson, D., **Park, J.**, & Pouyaei, A. (2023). Large eddy simulation of sneeze plumes and particles in a poorly ventilated outdoor air condition: A case study of the University of Houston main campus. *Science of The Total Environment*, 891, 164694. <https://doi.org/10.1016/j.scitotenv.2023.164694>
- Park, J.**, Jung, J., Choi, Y., Lim, H., Kim, M., Lee, K., Lee, Y. G., & Kim, J. (2023). Satellite-based, top-down approach for the adjustment of aerosol precursor emissions over East Asia: The TROPOspheric Monitoring Instrument (TROPOMI) NO₂ product and the Geostationary Environment Monitoring Spectrometer (GEMS) aerosol optical depth (AOD) data fusion product and its proxy. *Atmospheric Measurement Techniques*, 16(12), 3039–3057. <https://doi.org/10.5194/amt-16-3039-2023>
- Park, J.**, Jung, J., Choi, Y., Mousavinezhad, S., & Pouyaei, A. (2022). The sensitivities of ozone and PM_{2.5} concentrations to the satellite-derived leaf area index over East Asia and its neighboring seas in the WRF-CMAQ modeling system. *Environmental Pollution*, 306, 119419. <https://doi.org/10.1016/j.envpol.2022.119419>
- Jung, J., Choi, Y., Mousavinezhad, S., Kang, D., **Park, J.**, Pouyaei, A., Ghahremanloo, M., Momeni, M., & Kim, H. (2022). Changes in the ozone chemical regime over the contiguous United States inferred by the inversion of NO_x and VOC emissions using satellite observation. *Atmospheric Research*, 270, 106076. <https://doi.org/10.1016/j.atmosres.2022.106076>
- Park, J.**, & Lee, P. S.-H. (2020). Relationship between remotely sensed ambient PM₁₀ and PM_{2.5} and urban forest in Seoul, South Korea. *Forests*, 11(10), 1060. <https://doi.org/10.3390/f11101060>
- Lee, P. S.-H., & **Park, J.** (2020). An effect of urban forest on urban thermal environment in Seoul, South Korea, Based on Landsat Imagery Analysis. *Forests*, 11(6), 630. <https://doi.org/10.3390/f11060630>
- Lee, P. S.-H., **J, Park, J.**, & Seo, J. (2020). Estimation of ambient PM₁₀ and PM_{2.5} concentrations in Seoul, South Korea, using empirical models based on MODIS and Landsat 8 OLI imagery. *Korean Journal of Agricultural Science*, 47:59-66. <https://doi.org/10.7744/kjoas.20190087>
- Lee, S.-H., & **Park, J.-C.** (2019). Correlation between urban forest and satellite-borne imagery-based ambient particulate matter across Seoul, South Korea. *Journal of Agriculture & Life Science*, 53(6), 1–11. <https://doi.org/10.14397/jals.2019.53.6.1>

Research interests

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|----------------------|------------------------------|----------------|
| Air quality modeling | Numerical weather prediction | Remote sensing |
| Emissions | Inverse problem | Urban forests |

Work Experiences

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| Research Assistant , University of Houston, Houston, Texas, USA | May 2022 - Present |
| Teaching Assistant , University of Houston, Houston, Texas, USA Course: Introduction to Climate Change Lab | Aug 2021 – May 2022 |
| Research Assistant , University of Houston, Houston, Texas, USA Project: ▪ Satellite-based approach to improving the bottom-up estimates of NO _x , SO ₂ , and primary PM emissions over East Asia (funded by a grant from National Institute of Environment Research (NIER) under Ministry of Environment (MOE) of Republic of Korea: NIER-2021-01-02-071) | May 2021 - Aug 2021 |
| Teaching Assistant , University of Houston, Houston, Texas, USA Course: Introduction to Climate Change Lab | Aug 2020 - May 2021 |
| Researcher , Hanyang University, Seoul, Republic of Korea Projects: | Jul 2019 - Jun 2020 |

- Investigation on the mitigation effect of urban forest on air pollution in Seoul, Korea, using remote sensing techniques (funded by National Research Foundation of Korea (NRF))
- Feasibility study on the effects of urban forests and ventilation corridors on mitigating air pollution in Seoul, Korea (funded by Korea Forestry Promotion Institute (KOFPI))

Teaching Assistant, University of Texas at San Antonio, San Antonio, Texas, USA Aug 2018 - May 2019
 Courses: Introduction to Environmental System I and II, and Environmental Geology

Weather Briefer, The 6th CISM Military World Games, Mungyeong, Republic of Korea Oct 2-11, 2015
 Tasks: provided ultrashort-range aviation weather forecasts and weather briefings to international pilots and navigators for Aeronautical Pentathlon.

Aviation Weather Officer, The 16th Fighter Wing, Yecheon, Republic of Korea Feb 2014 - Nov 2016
 Positions:

- Weather unit commander (Feb 2016 - May 2016), forecast team chief (Sep 2015 - Feb 2016; May 2016 - Oct 2016), weather forecaster (Feb 2014 - Aug 2015; Oct 2016 - Nov 2016)

Tasks:

- Produced ultrashort-, short-, mid-, long-range forecasts for airborne and ground military operations.
- Assisted in decision-making process by forecasting aeronautical weather conditions based on numerical weather prediction models and real-time meteorological observations relayed from weather satellites, radars, and wind profilers.
- Issued weather advisories, warnings, and Terminal Aerodrome Forecasts (TAFs) for International Civil Aviation Organization (ICAO).
- Instructed pilots, officers, enlisted soldiers, and reserve forces basic meteorological services.
- Supplemented wartime forecast protocols for Korea-U.S. joint operations.

Software skills

Programming languages: Fortran, MATLAB, Python

Numerical modeling: WRF, CMAQ (DDM-3D, Process Analysis, ISAM), MEGAN, FINN

GIS and remote sensing: ArcGIS, QGIS, ENVI, ERDAS Imagine