

Sungtaek Son

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EDUCATION

- **Ph.D Student** at the **University of Washington**, Seattle, WA. **Biostatistics.** (Sep. 2021 - Expected on Jun. 2026)
- **Master of Statistics** at **Yonsei University**, Seoul, South Korea. **Applied Statistics.** (Mar. 2016 - Feb. 2018)
- **Bachelor of Arts** at **Yonsei University**, Seoul, South Korea. **Applied Statistics.** (Mar. 2010 - Feb. 2016)
- Exchange Student at the **University of Washington, Seattle.** (Sep. 2014 - Aug. 2015)

HONORS & AWARDS

- Brain Korea 21 Plus Scholarship, 2017.
- Korean Statistical Society Graduate Student Poster Presentation Award; 1st Place, Spring, 2017.
- Topic: Sparse Graphical Models via Calibrated Concave Convex Procedure with Application to fMRI Data.
- Bachelor-Master's Integrated Program Scholarship, 2016-2017.
- Merit-based Korea Student Aid Foundation Scholarship, 2014-2015.
- 3 Quarterly Dean's List – Annual Dean's List at the University of Washington, Seattle, 2014-2015.
- 2 Honors (2011-1st and 2011-2nd Semesters) and 3 High Honors (2010-1st, 2010-2nd, and 2014-1st Semesters), Yonsei University.

SKILLS

- Fluent user of **R** and **SAS/SQL**: Most frequently used software for statistical analysis (building packages or macros, Monte Carlo simulations, data visualization, etc.) and data management.
- **STATA**: Used STATA mostly for cleaning data and estimating econometric models as an undergraduate research assistant.
- **MATLAB**: Used MATLAB for implementation of scientific computing methods for AMATH 301 (Beginning of Scientific Computing) and MATH 464 (Numerical Analysis I) at the University of Washington, Seattle. Also used MATLAB for the analysis of fMRI data.
- **Python**: Used Python for developing an executable sample size computation program, and programming and implementation of machine learning methods such as random forest and neural networks.
- Fluent user of **JMP**, **SPSS**, **Minitab**, and **OriginLab**: Used for implementation of design of experiments, cosmetics clinical data analysis, statistical process control, and peak area integration at a biopharmaceutical company, Celltrion Inc.

EXPERIENCES

Kaiser Permanente Washington Health Research Institute – Research Assistant (2021 - Current)

Supervisor: Dr. Jennifer Bobb

- Primary Opioid Use Disorder (PROUD) project.
- More Individualized Care (MI-CARE) project.

Currently I am working with Dr. Bobb and Melissa Anderson (MS) from KPWHRI on the estimation of treatment effect of collaborative care on the OUD patients. This involves covariate selection and imputation from the pragmatic trials data.

Freelance Researcher

(2021)

- Collaborated with Dr. Ari Min (Department of Nursing, Chung-Ang University, Seoul, South Korea) on research project of 82 rotating-shift and 60 night shift nurses' alertness. Took the major role in the curation and analysis of Readiband wrist actigraph data. Four papers are published.
- Collaborated with Dr. Bong-Jin Hahm and Dr. Namwoo Kim (Department of Psychiatry and Behavioral Sciences, College of Medicine, Seoul National University, Seoul, South Korea) on a research project that investigates the relationship between COVID-19 testing and dementia outbreak. Took the major role in the curation and analysis of the nationwide COVID-19 data. The data was accessed via electronic health record from Korean National Health Insurance Sharing Service database. Research is complete with publication at *American Journal of Alzheimer's Disease & Other Dementias*. (<https://doi.org/10.1177/15333175211072387>)

Celltrion Inc. CMC (Chemistry, Manufacturing, and Controls) Statistics Team – Assistant Manager

(2017 - 2021)

- Collaborated with the Cell Science Team to statistically support the monoclonality of the company's biosimilar products (CT-P17 and CT-P59) in response to the request from the United States Food and Drug Administration and the South Korean Ministry of Food and Drug Safety.
- Established control limits for environmental monitoring system by Bayesian tolerance interval for zero-inflated data.
- Developed a statistical procedure for setting acceptance criteria for analytical comparability validation (technology transfer, small scale method quantification, etc.).

- Took responsibility in documentation and approval of non-clinical standard operating procedure guidelines for statistical software.
- Developed a procedure for statistical computation of limit of quantitation and limit of detection for non-linear models.
- Set up a procedure for bioanalytical method system suitability test with nonparametric tolerance interval.
- Designed statistical models for skin age estimation and relationship between related factors as part of the cosmetics recommendation system patent. The recommendation system was developed for use by the company's affiliate, Celltrion Skincare.
- Published a research paper as the first author that raises concerns and proposes an alternative method to the United States Food and Drug Administration's new draft guideline on analytical similarity assessment (*Development of Therapeutic Protein Biosimilars: Comparative Analytical Assessment and Other Quality-Related Considerations*).
- Established statistical experimental design and analysis processes for bioanalytical method validation (MV), and wrote standard MV protocol and report descriptions for statistical analysis section.
- Took a staple role in initiative implementation of Analytical Quality by Design: Design of experiments, model estimation, construction of method operable design region, and writing statistical analysis section of the method development report.
- Collaborated with the Intellectual Property Team and successfully defended for the originality of the company's bioanalytical method against Genentech's claim of patent infringement by generating an affidavit that contains a quantitative justification on the peak area integration approach.
- Analyzed vial contamination data via Bayesian logistic regression to statistically support for the company's claim on its successful control over defective rate near 0 percent in response to the concern raised by the United States Food and Drug Administration.
- Developed a SAS program that simultaneously manipulates, handles missing values, implements the slope-ratio model, and reports the hemagglutinin content test results from single radial immunodiffusion.
- Lectured statistical methods to Quality Control (QC) division as part of Good Manufacturing Practice (GMP) training.

Molecular and Cellular Nutrition Laboratory, Yonsei University (2016-2021)

- Provided statistical consulting and analysis service as a visiting researcher.
- Analyzed reciprocal causalities of taste thresholds and quality of life of the elderly population by three stage least squares regression and collaborated with researchers on data analysis tasks. <https://doi.org/10.3390/nu13051693>.
- Analyzed breast cancer patient data with mixed-effect cumulative logistic models and nonparametric methods, and contributed to the conclusion of the study. <https://doi.org/10.1007/s00520-019-04924-9>.
- Taught relevant statistical methods and the implementation of the analyses with statistical software such as R, SAS, and SPSS.
- Validated of contents on statistical education materials.

Teaching Assistant for Applied Statistics Department, Yonsei University (2016 - 2017)

- Worked as a teaching assistant for Introduction to Statistics, Mathematical Statistics, and Regression Analysis.

Yonsei Institute of Statistical Science, Yonsei University (2016 - 2017)

- Led a team of 6 statistics graduate students as a chief research assistant.
- Provided statistical consulting, analysis and education service.
- Took responsibility in statistical analysis on research projects ranging from finance, marketing and econometrics to dentistry, education and public health.
- The last project was the model estimation for foreign direct investment to South East Asia using mixed effect LASSO.
- Marketing and preparation for SPSS and R program seminars.

Residential College, Yonsei University (2015 - 2016)

- Led a group of residential assistants (8) and a house of freshmen students (300) as a chief residential assistant.
- Taught Calculus, Linear Algebra, Introduction to Statistics, and Mathematical Economics as a tutoring residential assistant.

Information Systems Department at Foster School of Business, The University of Washington (2014 - 2015)
Supervisor: Professor Aravinda Garimella and Professor Ming Fan

- Participated in a research on verifying direct and indirect reciprocity as an undergraduate research assistant.
- Conducted data manipulation, statistical analysis and visualization of data collected from Khan Academy online math lectures that consists of comments (questions and answers) exchanged by the viewers with R and STATA.

Military Service, Republic of Korea Army (2012 - 2014)

RESEARCH & PUBLICATIONS

- **Son S.**, Kang N., and Jeon Y. Group LASSO with EM algorithm in generalized linear mixed model. Working paper.
- **Son S.** and Jeon Y. Statistical derivation of flexible acceptance margin for an equivalence test. Manuscript prepared for submission

to *Journal of Agricultural, Biological, and Environmental Statistics*.

- Min A., **Son S.**, Scott L., and Hong H. (2022), Overtime and alertness of rotating-shift nurses: An observational study using ecological momentary assessment, *Journal of Clinical Nursing*. <https://doi.org/10.1111/jocn.16218>.
- Seong J., **Son S.**, and Min A. (2022), Effect of sleep on alertness at work among fixed night shift nurses: A prospective observational study, *Journal of Advanced Nursing*. <https://doi.org/10.1111/jan.15180>.
- Kim N., **Son S.**, Kim S., Lee J., Ahn Y., Yon D., and Hahm B. (2021), Association between dementia development and COVID-19 among individuals who tested negative for COVID-19 in South Korea: a nationwide cohort study, *American Journal of Alzheimer's Disease & Other Dementias*. (Co-first author). <https://doi.org/10.1177/15333175211072387>.
- Min A., Hong H., **Son S.**, and Lee T. (2021), Alertness during working hours among eight-hour rotating-shift nurses: An observational study, *Journal of Nursing Scholarship*. <https://doi.org/10.1111/jnu.12743>.
- Min A., Hong H., **Son S.**, and Lee T. (2021), Sleep, fatigue and alertness during working hours among rotating-shift nurses in Korea: An observational study, *Journal of Nursing Management*. <https://doi.org/10.1111/jonm.13446>.
- Jeon S., Kim Y., Min S., Song M., **Son S.**, and Lee S. (2021), Taste Sensitivity of Elderly People Is Associated with Quality of Life and Inadequate Dietary Intake, *Nutrients*, <https://doi.org/10.3390/nu13051693>.
- **Son S.**, Oh M., Choo M., Chow SC, Lee S. (2020), Some Thoughts on the Quality Range Method for Analytical Similarity Evaluation, *Journal of Biopharmaceutical Statistics*, <https://doi.org/10.1080/10543406.2020.1726372>.
- **Son S.**, Park C., Jeon Y. (2019), Sparse Graphical Models via Calibrated Concave Convex Procedure with Application to fMRI Data, *Journal of Applied Statistics*, <https://doi.org/10.1080/02664763.2019.1663158>.
- Kim Y., Kim G., **Son S.**, Song M., Park S., Chung H., Lee S. (2019), Changes in Taste and Food Preferences in Breast Cancer Patients Receiving Chemotherapy: a Pilot Study, *Supportive Care in Cancer*, <https://doi.org/10.1007/s00520-019-04924-9>.