

# MIN HYUNG GYU

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## FIELDS OF INTEREST

Dimension Reduction, Quantum Machine Learning, Nonparametric Model, Deep Learning Theory, Optimization

## EDUCATION

Sep 2020 - Present **Yonsei University**, Seoul, Republic of Korea  
Master of Arts, Statistics  
GPA: 4.26/4.30 (**4.00/4.00**)

Mar 2014 - Aug 2020 **Yonsei University**, Seoul, Republic of Korea  
Bachelor of Arts, Applied Statistics  
Stat & Math GPA: 4.11/4.30 (**3.91/4.00**) Overall GPA: 3.66/4.30 (**3.54/4.00**)

## STANDARDIZED TESTS

TOEFL iBT **101/120**: 30/28/23/20 (R/L/S/W) October 13, 2021  
GRE General Test **V 161** (88%)/ **Q 169** (94%)/ **W 3.5** (37%) February 26, 2021

## Relevant Coursework

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|--------------------------------|----------------------------|---------------------------|
| • Dimension Reduction Theory   | • Bayesian Statistics      | • Big Data Case Studies   |
| • Big Data - Quantum computing | • Statistical Computing    | • Mathematical Statistics |
| • Theory Of Deep Learning      | • Generalized Mixed Models | • Analysis 1              |

## Relevant Study Experience

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|--------------------------|--|
| Quantum Computing        | - Sutor, R. (2019). Dancing With Qubits. Birmingham, UK: Packt.  |
| Quantum Machine Learning | - Schuld, M. & Petruccione, F. (2019). Supervised Learning with Quantum Computers, Cham, Switzerland: Springer |
| Theory of Hilbert Space  | - Debnath, L. & Mikusinski, P. (2005). Introduction to Hilbert Space. London, UK: Elsevier Academic Press      |
| Abstract Integration     | - Rudin, W. (1987). Real and Complex Analysis. Singapore: McGraw-Hill.   |
| Convex Optimization      | - Boyd, S. & Vandenberghe, L. (2004) Convex Optimization. Cambridge, UK: Cambridge University Press.           |
| RKHS                     | - Li, B. (2018). Sufficient Dimension Reduction. Boca Raton, FL: CRC Press.                                    |
| Bayesian Statistics      | - Gelman, A., Carlin, B.J., ... & Rubin, D.B. (2021). Bayesian Data Analysis. Boca Raton, FL: CRC Press.       |

## PROGRAMMING SKILLS

Python(;;Qiskit, Scikit-Learn, Tensor Flow), R(;;Rcpp, Shiny, Tidyverse)

## AWARDS AND HONORS

May 2019 Excellence Prize for 2019 Embrain Panel Big Data Analysis Competition  
Fall 2019 High Honors (Yonsei University)

## WORKING PAPERS

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<b>Relation Analysis in Microbiota</b> Submitted	<b>Altered gut microbiota in individuals with episodic and chronic migraine</b> <ul style="list-style-type: none"><li>- Cooperated with Department of Diagnostic Laboratory Medicine</li><li>- Made poisson regression models and analyzed the relation between frequency of migraine and microbiota</li><li>- Supervised a statistical test procedure of the paper</li></ul>
<b>Deep Learning Visualization</b> In preparation	<b>Estimating Predictive Distribution using Hybrid Deep-SDR</b> <ul style="list-style-type: none"><li>- A research for interpreting deep learning using sufficient dimension reduction method</li><li>- Applied sufficient dimension reduction techniques to last layer of neural network</li><li>- Used for estimation of predictive distribution, visualization of results, analysis for cluster of data points, detection of outlier</li></ul>
<b>Quantum Machine Learning</b> In preparation	<b>Quantum Convolutional Neural Network with Statistical Encoding</b> <ul style="list-style-type: none"><li>- A research for developing quantum convolutional neural network with statistical techniques</li><li>- Built QCNN model and applied to actual data such as MNIST or fashion MNIST</li><li>- Compared classical data encoding methods with SDR encoding methods</li></ul>

## TEACHING EXPERIENCES

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<b>Yonsei University</b> Sep 2021 - present	<b>Teaching Assistant</b> for Big Data and Quantum computing (graduate, Fall 2021) - Dr. <i>Hakbea Lee</i>
<b>Yonsei University</b> Sep 2021 - present	<b>Teaching Assistant</b> for Multivariate Analysis (Undergraduate, Fall 2021) - Dr. <i>Hakbea Lee</i>
<b>Yonsei University</b> Mar 2021 - June 2021	<b>Teaching Assistant</b> for Statistical Data Analysis (Undergraduate, Spring 2021 ) - Dr. <i>Hakbea Lee</i>
<b>Yonsei University</b> Sep 2020 - Dec 2020	<b>Teaching Assistant</b> for Introduction to Statistics (Undergraduate, Fall 2020 ) - <i>Instructor Ho Gyu Lee</i>

## EXTRACURRICULAR ACTIVITIES

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<b>Yonsei University</b> Mar 2021 - Present	<b>Institute of Data Science</b> Consulting Assistant Director: Dr. Hyun Tae Kim <ul style="list-style-type: none"><li>- Assisted constructing consulting program as a founding member of renewed institute</li><li>- Consulted graduate students about Academic statistical method for their paper e.g. Study for comparing efficiency of micro-needle or Study for correlation between acceptance rate of bill and governments</li></ul>
<b>Yonsei University</b> Jan 2019 - Dec 2020	<b>Data Science Lab(DSL)</b> Director of Academic Affairs Advisor: Dr. Tae Young Park (Yonsei University) <ul style="list-style-type: none"><li>- Undergraduate academic club for studying data science and statistical theories</li><li>- Act as a founding member and constructed several programs for study and experience</li><li>- Opened class for undergraduate students e.g. Bayesian Statistics, Convex Optimization</li></ul>

## REFERENCES

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Dr. <b>Hakbea Lee</b> Department of Statistics Yonsei University	hblee@yonsei.ac.kr Professor
Dr. <b>Ick Hoon Jin</b> Department of Statistics Yonsei University	ijin@yonsei.ac.kr Professor
Dr. <b>Jaewoo Park</b> Department of Statistics Yonsei University	jwpark88@yonsei.ac.kr Professor