

Juhyun ‘Simon’ Park

<https://parksimon0808.github.io/>

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Education	Princeton University A.B. in Mathematics, Department GPA 3.97/4.0 Certificates: Applications of Computing, Statistics and ML (Leave of Absence for Military Service)	<i>Princeton, NJ, USA</i> <i>Sep 2017 - May 2013</i> <i>(2019 - 2021)</i>
Interests	Machine Learning Theory, Deep Learning Theory, Optimization, Natural Language Processing	
Research Experience	Machine Learning Theory 1. Effect of L2 Regularization on ReLU Networks Current <i>Advisor: Boris Hanin</i> <ul style="list-style-type: none">Analyzing how L2 regularization on infinite-width, 1-layer networks restricts the function space for 2-dimensional dataProviding more insight into what it means to minimize total deviation norm of the gradient of a function on high dimensional input 2. Robustness of Shapley Values for Data Valuation Spring 2022 <i>Advisor: Sanjeev Arora</i> <ul style="list-style-type: none">Analyzed the robustness of Shapley values across different training settingsProposed a novel approach of approximating Shapley values by evaluating on simpler models with similarly expressive power Natural Language Processing 1. Effectiveness of In-Context Learning Current <i>Advisor: Danqi Chen</i> <ul style="list-style-type: none">Analyzing empirically what aspects of in-context learning contribute to open-domain QA and summarization tasksShuffling gold answers, extracting random sentences from contexts, selecting random English words with the same semantic meaning, etc. 2. Joint Multi-task Language Model Spring 2022 <i>Advisor: Karthik Narasimhan</i> <ul style="list-style-type: none">Proposed a variation of a joint multi-task language model for Vietnamese that outperforms the baseline model Theoretical Computer Science 1. General Matroid Secretary Problem Spring 2022 <i>Advisor: Matt Weinberg</i> <ul style="list-style-type: none">Proposed multiple algorithms for the Matroid Secretary Problem generalized from the ordinary Secretary ProblemProved their properties using the greedy algorithm and forbidden set frameworks 2. Free-Order Matroid Secretary Problem Fall 2021 <i>Advisor: Matt Weinberg</i> <ul style="list-style-type: none">Proposed a variation to an algorithm with a competitive ratio of 4For uniform matroids, proved that the variation has a constant competitive ratio; conjectured that the ratio converges to e if the size of the matroid tends to infinityFor general matroids, empirically observed that the algorithm is likely to have a competitive ratio close to e 3. Applications of Polynomial Methods Fall 2021 <i>Advisor: Alan Chang</i> <ul style="list-style-type: none">Studied how polynomial methods can be applied to Joints and Nikodym Problems	

	Transportation Research and Urban Engineering Lab KAIST <i>Advisor: Yoonjin Yoon (Department of Civil and Environmental Engineering)</i>	
	1. Resiliency of East Asian Air Network to Adversarial Attacks Summer 2019	
	<ul style="list-style-type: none"> Through simulations, presented that the East Asian air network is more robust to adversarial attacks than the global network 	
	2. Prediction of Seoul Metro Ridership Summer 2019	
	<ul style="list-style-type: none"> Designed a LSTM model to predict the hourly ridership of Seoul metro 	
Publication	Arora, S., Park, S. , Jacob, D., and Chen, D., "Introduction to Machine Learning: Lecture Notes for COS324 at Princeton University," 2022. [link] Park, S. , "Extension of Simple Algorithms to the Matroid Secretary Problem," 2022. [link]	
Awards	Shapiro Award for Academic Excellence <i>Sep 2019</i> Princeton University, Top 3% of Class Hanseong Sonjaehan Scholarship Foundation <i>Aug 2015</i> Top 150 in Republic of Korea	
Teaching Experience	Introduction to Machine Learning Undergraduate TA <i>Current</i> LaTeX Trainer Lab TA <i>Current</i> Introduction to Programming Systems Lab TA <i>Spring 2022, Current</i> Algorithms and Data Structures Lab TA <i>Spring 2022, Current</i> Algorithms and Data Structures Grader <i>Spring 2019, Fall 2021</i> Computer Science: An Interdisciplinary Approach Grader <i>Fall 2018</i>	
Skills	Programming Languages: Fluent in Java, Python, C / Familiar with R, SQL Natural Languages: Native in Korean / Fluent in English, Mandarin Chinese	
Relevant Coursework	Computer Science (graduate courses in bold , courses for next semester in <i>italics</i>) <ul style="list-style-type: none"> Mathematical Understanding of Deep Learning, Understanding Large Language Models, Advanced Algorithm Design, <i>Optimization for Machine Learning</i>, Introduction to Machine Learning, Natural Language Processing, <i>Neural Networks: Theory and Applications</i> Mathematics <ul style="list-style-type: none"> Real/Complex Analysis, Algebra, Probability, Statistics, Stochastic Systems, Theory of Computation, Game Theory, <i>Analysis of Big Data</i> 	
Extracurricular Activities	Korean Augmentation to the US Army <i>Nov 2019 - Jun 2021</i> Translated for high-ranking officers Korean Students Association at Princeton <i>Feb 2019 - May 2019</i> Events Director Harvard-MIT Math Tournament <i>Feb 2019</i> Grader Princeton University Math Competition <i>Nov 2018</i> Tech Team, Problem Reviewer	