

Yo Joong “YJ” Choe

Postdoctoral Scholar

Data Science Institute, University of Chicago

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RESEARCH INTERESTS

Game-Theoretic Statistics: anytime-valid inference for sequential data & forecasters; e-values & e-processes; confidence sequences; testing-by-betting
Science of Large Language Models: causal representations; geometry of LLM embeddings; Transformers; mechanistic interpretability

EMPLOYMENT

Postdoctoral Scholar

Sep 2023 – current

Data Science Institute, University of Chicago

Mentor: Victor Veitch

Research Scientist (Deep Learning & NLP)

Aug 2019 – Nov 2020

Kakao Brain

Research Scientist (Deep Learning & NLP)

Jul 2017 – Jul 2019

Kakao

EDUCATION

Ph.D. in Statistics and Machine Learning

2015 – 2023

Carnegie Mellon University

(On leave: 2017 – 2020)

Advisor: Aaditya Ramdas

Thesis: Comparing Forecasters and Abstaining Classifiers ([thesis](#), [slides](#))

M.S. in Machine Learning

2015 – 2017

Carnegie Mellon University

Advisors: Aarti Singh, Sivaraman Balakrishnan, and Timothy Verstynen

Thesis: Finding Relationships Between Structural and Functional Brain Networks via Connectome Fingerprinting

B.S. in Mathematics and Computer Science, Honors

2011 – 2015

University of Chicago

AWARDS

Student Poster Award (*Runner-up; \$10K Research Grant*)

2022

Citadel Securities Inaugural PhD Summit

Franklin V. Taylor Memorial Award (*Best Paper and Presentation*)

2018

IEEE Systems, Man, and Cybernetics (SMC) Society

Phi Beta Kappa

2014

University of Chicago

PREPRINTS

Combining Evidence Across Filtrations Using Adjusters (arXiv, slides)

Yo Joong Choe, Aaditya Ramdas

arXiv, 2024

Contributed talk at **JSM 2024** (August); Invited talk at **ICSIDS 2024** (December)

The Linear Representation Hypothesis and the Geometry of Large Language Models (arXiv, code, slides)

Kiho Park, Yo Joong Choe, Victor Veitch

arXiv, 2023

Oral presentation at *NeurIPS Workshop on Causal Representation Learning*

JOURNAL PAPERS

Comparing Sequential Forecasters (proc, arXiv, code, slides, poster)

Yo Joong Choe, Aaditya Ramdas

Operations Research, 2023

Preliminary work presented at *SAVI 2022* and *JSM 2021*

Poster Award (Runner-up; \$10K Research Grant), *Citadel PhD Summit*

Predicting Drug-Target Interaction Using a Novel Graph Neural Network with 3D Structure-Embedded Graph Representation (proc)

Jaechang Lim, Seongok Ryu, Kyubyong Park, Yo Joong Choe, Jiyeon Ham, Woo Youn Kim

Journal of Chemical Information and Modeling, 2019

CONFERENCE
PAPERS

Counterfactually Comparing Abstaining Classifiers

(proc, arXiv, code, slides, poster)

Yo Joong Choe, Aditya Gangrade, Aaditya Ramdas

Advances in Neural Information Processing Systems (NeurIPS), 2023

Preliminary work presented (oral) at *ICML 2023 Workshop on Counterfactuals*

KorNLI and KorSTS: New Benchmark Datasets for Korean Natural Language Understanding (proc, arXiv, code)

Jiyeon Ham^{*}, Yo Joong Choe^{*}, Kyubyong Park^{*}, Ilji Choi, Hyungjoon Soh

Findings of the Association for Computational Linguistics: EMNLP, 2020

word2word: A Collection of Bilingual Lexicons for 3,564 Language Pairs (proc, arXiv, code)

Yo Joong Choe^{*}, Kyubyong Park^{*}, Dongwoo Kim^{*}

Language Resources and Evaluation Conference (LREC), 2020

Jejuo Datasets for Machine Translation and Speech Synthesis

(proc, arXiv, code)

Kyubyong Park, Yo Joong Choe, Jiyeon Ham

Language Resources and Evaluation Conference (LREC), 2020

Discovery of Natural Language Concepts in Individual Units of CNNs

([proc](#), [arXiv](#), [poster](#), [code](#))

Seil Na, Yo Joong Choe, Dong-Hyun Lee, Gunhee Kim

International Conference on Learning Representations (ICLR), 2019

Local White Matter Architecture Defines Functional Brain Dynamics

([proc](#), [arXiv](#), [slides](#))

Yo Joong Choe, Sivaraman Balakrishnan, Aarti Singh, Jean Vettel, Timothy Verstynen

IEEE International Conference on Systems, Man, and Cybernetics (SMC), 2018

Franklin V. Taylor Memorial Award (*for Best Paper and Oral Presentation*)

WORKSHOP PAPERS

(^[P]: PUBLISHED)

An Empirical Study of Invariant Risk Minimization ([arXiv](#), [code](#), [slides](#))

Yo Joong Choe, Jiyeon Ham, Kyubyong Park

ICML Workshop on Uncertainty and Robustness in Deep Learning, 2020

^[P]**A Neural Grammatical Error Correction System Built On Better Pre-training and Sequential Transfer Learning** ([proc](#), [arXiv](#), [code](#))

Yo Joong Choe^{*}, Jiyeon Ham^{*}, Kyubyong Park^{*}, Yeol Yoon^{*}

Proceedings of the 14th Workshop on Innovative Use of NLP for Building Educational Applications (BEA), 2019

Runner-up, ACL Workshop Shared Task (*Restricted & Low Resource Tracks*)

Learning Diverse Overcomplete Dictionaries via Determinantal Priors

([abstract](#))

Maruan Al-Shedivat, Yo Joong Choe, Neil Spencer, Eric P. Xing

ICML Workshop on Geometry in Machine Learning, 2016

MISCELLANEOUS

Probabilistic Interpretations of Recurrent Neural Networks ([report](#))

Collaborators: Jaehyeok Shin, Neil Spencer

Technical Report, 2017

A Statistical Analysis of Neural Networks ([report](#))

Technical Report, 2016

Sparse Additive Models with Shape Constraints ([report](#), [slides](#), [code](#))

Mentors: John Lafferty, Sabyasachi Chatterjee, Min Xu

University of Chicago Computer Science REU, 2014

TALKS

Int'l Conference on Statistics and Data Science (ICSIDS)

Nice, France

Combining Evidence Across Filtrations Using Adjusters

Dec 2024

Joint Statistical Meetings (JSM)

Portland, OR, USA

Combining Evidence Across Filtrations Using Adjusters

Aug 2024

	Workshop on Safe, Anytime-Valid Inference Eindhoven, Netherlands <i>Comparing Sequential Forecasters</i> Jun 2022
	Seoul Tech Society Seoul, South Korea <i>A Casual Introduction to Machine Learning & Deep Learning</i> May 2019
ACADEMIC SERVICES	Session Chair Joint Statistical Meetings (JSM) 2024
	Reviewer International Conference on Machine Learning (ICML) 2024 ACM T. on Asian and Low-Resource Language Information Processing 2023 Journal of the Royal Statistical Society: Series C (Applied Statistics) 2022 ICML Workshop on Adaptive & Multitask Learning 2019
TEACHING	Postdoctoral Mentor for Student Projects <i>University of Chicago, Data Science Institute Clinic</i> (In the clinic, student teams work with external clients' data science projects. Below is the list of clients whose projects I mentored.) Argonne National Laboratory, AI for Operations Fall 2023 – Spring 2024
	Teaching Assistant <i>Carnegie Mellon University</i> UnitedHealth Group Bridges to Healthcare Technology Summer 2023 (Summer Undergraduate Research Program) Simulation Methods for Option Pricing Spring 2023 Financial Time Series Analysis Spring 2022; 2023 Data Science in Sports & Healthcare Summer 2022 (Summer Undergraduate Research Program) Special Topics: Methods of Statistical Learning Spring 2021 Statistical Machine Learning II Fall 2016 Introduction to Probability Modeling Spring 2016 Statistical Computing Fall 2015 <i>University of Chicago</i> Machine Learning and Large-Scale Data Analysis Spring 2015 Foundations of Computational Data Analysis Winter 2015 Calculus I-II-III Fall 2012 – Spring 2013