

JUSTIN S. KANG

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🔗 justinkang221.github.io

I am a hardworking and effective researcher with a strong quantitative background. I have a diverse skill set and enjoy finding creative solutions to problems in deep learning. My most recent work (below), approaches explaining LLMs with ideas from information theory and signal processing.

PUBLICATIONS AND PRE-PRINTS

Learning to Understand: Identifying Interactions via the Mobius Transforms

Justin Singh Kang, Y.E. Erginbas, L. Butler, R. Pedarsani, K. Ramchandran

- Submitted for publication, 2024. [Pre-print available](#).

Learning a 1-Layer Conditional Generative Model in Total Variation

A. Jalal, Justin Singh Kang, A. Uppal, K. Ramchandran, and E. Price

- Presented at [NeurIPS](#), 2023.

The Fair Value of Data Under Heterogeneous Privacy Constraints in Federated Learning

Justin Singh Kang, R. Pedarsani and K. Ramchandran

- Presented at [NeurIPS Federated Learning@FM](#), 2023. [TMLR](#), 2024.

Efficiently Computing Sparse Fourier Transforms of q -ary Functions

Justin Singh Kang, Y. E. Erginbas*, A. Aghazadeh and K. Ramchandran*

- Presented at [IEEE ISIT](#), 2023. *=equal contribution.

Scheduling versus Contention for Massive Random Access in Massive MIMO Systems

Justin Singh Kang and W. Yu

- Published in [IEEE Transactions on Communications](#), Sep 2022.

Minimum Feedback for Collision-Free Scheduling in Massive Random Access

Justin Singh Kang and W. Yu

- Published in [IEEE Transactions on Information Theory](#), Dec 2021.
- Winner of the prestigious [2024 IEEE ITSoc & ComSoc Joint Paper Award](#).

WORK EXPERIENCE

Student Researcher

Google

📅 May 2024 – August 2024

📍 Mountain View, California

Designing explainable embeddings of programs for Google cloud platforms. Enabling optimized routing and performance prediction while maintaining human understanding. My research is part of the Google Cloud Systems Research Group (SRG), led by Prof. David Culler.

Research and Development Engineering Intern

Intel

📅 April 2017 – August 2018

📍 Vancouver, Canada

Design and optimization of error correction for SSD controllers using information theory, error coding theory and architectural improvements. Research resulted in US Patent [11146289B2](#).

SKILLS

Languages: Python, MATLAB, Git, \LaTeX , (hardware) SystemVerilog, UVM

Domains: Machine Learning, Data Science, Explainable AI, Data Valuation

EDUCATION

PhD in EECS

With Prof. Kannan Ramchandran

GPA: 4.0, Berkeley Graduate Fellow

UC Berkeley, 2021-present

MASc Electrical Engineering

With Prof. Wei Yu

GPA: 4.0, Canadian Graduate Scholarship

University of Toronto, 2021

BASc Engineering Physics

GPA: 91.1%, Activities: President of Engineering Physics Student Association

University of British Columbia, 2019

SELECTED AWARDS

- IEEE Information Theory Society and Communication Society Joint Paper Award, 2024
- Meta AI-BAIR Grant, 2023
- Berkeley Graduate Fellowship, 2021
- NSERC CGS-D (3rd nationally in area), 2021
- Trek Excellence Scholarship (5x), 2014-19
- Bycast Award, Entrepreneurship, 2018
- Donald J. Evans Scholarship (2x), 2017-18

PROJECTS

Efficient Machine Unlearning

Meta-BAIR Program, Sep 2023 – present

- Developing new tools for unlearning algorithms, which are used to remove traces of data that was originally in the training set.
- Exploiting embedding geometry to understand which points are more or less important to unlearn.

Fitness Tracking with Machine Vision

Jan 2018 – Apr 2019

- Entrepreneurial project on training a neural network model to classify 11 different exercises from video inputs.
- Awarded \$10,000+ in grants, resulted in a short-lived start-up.