

Education

- 2021- Present PhD in Mathematics
University of California, San Diego
Advisors: Alex Cloninger and Gal Mishne
- 2018-2020 MS in Computational Science, Mathematics and Engineering.
University of California, San Diego
GPA - 4.0 / 4.0
- 2012-2016 BTech in Mathematics and Computing.
Indian Institute of Technology, Guwahati
GPA - 9.06 / 10, Department Rank 2 / 54

Work Experience

- May 2020 - Software Development Engineer,
May 2021 **Amazon.com Services, Inc.**, Sunnyvale (USA)
- Applied manifold learning techniques to analyze the spectral features of the channel state information (CSI) of the links between wireless devices, for detecting human motion.
- Jun 2019 - Software Development Engineer Intern,
Sep 2019 **Amazon.com Services, Inc.**, Sunnyvale (USA)
- Benchmarked recommendation algorithms including Generalized Matrix Factorization, Neural Matrix Factorization and Hierarchical Recurrent Neural Network with the objective of improving cache-hit.
- Jun 2016 - Software Engineer, Advanced Technology Lab - Multimedia Division
Mar 2017 **Samsung Research Institute**, Bangalore (India)
- Developed a regularizer that constrained filters in a convolutional neural network (CNN) to be circularly symmetric and used it to build a rotation invariant CNN.
 - Developed an algorithm for temporal segmentation of a video with the aim to maximize diversity among segments based on sequential determinantal point process.
- May 2015 - Research Intern, Cloud and Information Services Lab Group
Jul 2015 **Microsoft Research**, Bangalore (India)
- Worked on real-time detection of issues in high-dimensional time series data with the aim of detecting the time of the anomaly and the subset of attributes which caused it.
 - Modeled the data using a time-varying gaussian distribution whose mean had sparse dictionary based representations that were learned automatically and the sparse codes were constrained to be temporally dependent.
- May 2014 - Software Developer, Google Summer of Code
Aug 2014 **International Neuroinformatics Coordinating Facility**
- Developed an open source software “mindthegap” that vectorizes bitmaps of brain slices without introducing gaps or overlaps between adjacent regions. [Link]

Publications

D. Kohli, A. Cloninger, G. Mishne, *Tearing and Repulsion Enabled Registration of Point Clouds*, Submitted, 2024.

S. Robertson*, **D. Kohli***, G. Mishne, A. Cloninger, *On a Generalization of Wasserstein Distance and the Beckmann Problem to Connection Graphs*, Submitted, 2024. [\[Link\]](#)

D. Kohli, G. Mishne, A. Cloninger, *Non-degenerate Rigid Alignment in a Patch Framework*, Submitted, 2023. [\[Link\]](#)

D. Kohli, A. Cloninger, G. Mishne, *Low Distortion Local Eigenmaps*, Journal of Machine Learning Research, Volume 22, 2021. [\[Code\]](#)[\[Link\]](#)

D. Kohli, J. M. Rabin, *Asymmetric Expansion preserves Hyperbolic Convexity*, Journal of Geometry, Volume 111 Article 33, 2020. [\[Link\]](#)

D. Kohli, J. M. Rabin, *Radial Expansion preserves Hyperbolic Convexity and Radial Contraction preserves Spherical Convexity*, Journal of Geometry, Volume 110 Article 40, 2019. [\[Link\]](#)

D. Kohli, B. C. Das, V. Gopalakrishnan, K. N. Iyer, *Learning Rotation Invariance in Deep Hierarchies using Circular Symmetric Filters*, International Conference on Acoustics, Speech and Signal Processing, 2017. [\[Link\]](#)

Teaching Assistant Experience

2018-**University of California, San Diego**
Present (DSC 205) *Geometry of Data*, (MATH 170A) *Numerical Linear Algebra*, (MATH 170B) *Numerical Analysis*, (MATH 183) *Statistical Methods*, (MATH 20E) *Vector Calculus*, (MATH 11) *Calculus Based Probability and Statistics*.

Awards and Honors

2021-2025 UCSD Halicioğlu Data Science Institute (HDSI) PhD Fellowship.

2021-2025 UCSD Department of Mathematics, James B. Ax Fellowship.

2017 Ranked 18 across country in entrance exam for Master in Statistics organized by Indian Statistical Institute, Kolkata. [\[Link\]](#)

2014 Ranked 1 across the country in CUDA Coding Challenge India organized by Nvidia in High Performance Computing Conference. [\[Code\]](#)[\[Link\]](#)

2012 Ranked 2076 out of 600,000 students in IIT Joint Entrance Exam.

Relevant Coursework and Skills

Spectral Graph Theory, Optimization, Differential Geometry, Computational Neuroscience, Numerical Analysis; Python, MATLAB, CUDA, C++, Tensorflow, PyTorch, LLMs, Git, LaTeX.

Talks and Conferences

Mar 2024 Dagstuhl Seminar on Low-Dimensional Embeddings of High-Dimensional Data: Algorithms and Applications (Talk).

Jul 2023 Sampling Theory and Applications Conference (SAMPTA) at Yale (Participant).

Apr 2023 Southern California Applied Mathematics Symposium (SOCAMS) at UC Irvine (Talk).

Mar 2023 Computational and Systems Neuroscience (COSYNE) in Montreal (Poster).

Oct 2022 Fall Fourier Talks (FFT) at the Norbert Wiener Center, University of Maryland (Poster).

Mar 2021 SoCal ML and NLP Symposium 2021 at UC San Diego (Poster).