

Dhruv Kohli

Curriculum Vitae

✉ dhkohli@ucsd.edu
📄 chiggum.github.io
[Math.StackExchange Profile](#)

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

- 05/2020- 05/2021 Software Development Engineer,
Amazon.com Services, Inc., Sunnyvale (USA)
- Human motion detection using the spectral features of the channel state information (CSI) of the links between wireless devices.
- 06/2019- 09/2019 Software Development Engineer Intern,
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.
- 06/2016- 03/2017 Software Engineer, Advanced Technology Lab - Multimedia Division
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.
- 05/2015- 07/2015 Research Intern, Cloud and Information Services Lab Group
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.
- 05/2014- 08/2014 Software Developer, Google Summer of Code
International Neuroinformatics Coordinating Facility
- Developed an open source software "mindthegap" that vectorizes bitmaps of brain slices without introducing gaps or overlaps between adjacent regions. [\[Link\]](#)

Research Experience

- Winter 2020 Research Assistant, Halicioğlu Data Science Institute, UC San Diego
Developed a novel technique for manifold learning which competes with existing techniques in visualization quality and can also embed manifolds without boundary as well as non-orientable manifolds into their intrinsic dimension.
- Spring 2019 Research Assistant, Neurobiology Department, UC San Diego
Implemented a technique to detect the vagal tone of the vocalizer by convolving a learned filter with the modulation power spectrum of the vocal signals.

Teaching Experience

- Spring 2022 Teaching Assistant, MATH 170B *Numerical Analysis*, UC San Diego.
- Winter 2022 Teaching Assistant, MATH 170A *Numerical Linear Algebra*, UC San Diego.
- Fall 2021 Teaching Assistant, MATH 20E *Vector Calculus*, UC San Diego.
- Fall 2019 Teaching Assistant, CSE 291 *Geometry of Data*, UC San Diego.
- Winter 2019 Teaching Assistant, MATH 183 *Statistical Methods*, UC San Diego.
- Fall 2018 Teaching Assistant, MATH 11 *Calculus Based Probability and Statistics*, UC San Diego.

Publications

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

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.

Skills

MATLAB, Python, CUDA, C++, Tensorflow, PyTorch, Git, LaTeX