Dhruv Kohli

Curriculum Vitae

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Math.StackExchange Profile

Education

2018-2020 Master of Science in Computational Science, Mathematics and Engineering.
University of California, San Diego
GPA - 4.0 / 4.0

2012-2016 Bachelor of Technology in Mathematics and Computing.
Indian Institute of Technology, Guwahati
GPA - 9.06 / 10, Department Rank 2 / 54

Work Experience

05/2020- Present — Software Development Engineer,
Amazon.com Services, Inc., Sunnyvale (USA)

- Working on the detection of human motion 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, Halıcıoğlu 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

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

Dhruv Kohli, Alex Cloninger, Gal Mishne, *Low Distortion Local Eigenmaps*, in progress.

Dhruv Kohli, Jeffrey M. Rabin, *Asymmetric Expansion preserves Hyperbolic Convexity*, Journal of Geometry, Volume 111 Article 33, 2020. [Link]

Dhruv Kohli, Jeffrey M. Rabin, *Radial Expansion preserves Hyperbolic Convexity and Radial Contraction preserves Spherical Convexity*, Journal of Geometry, Volume 110 Article 40, 2019. [Link]

Dhruv Kohli, Biplab Ch Das, Viswanath Gopalakrishnan, Kiran Nanjunda Iyer, *Learning Rotation Invariance in Deep Hierarchies using Circular Symmetric Filters*, International Conference on Acoustics, Speech and Signal Processing, 2017. [Link]

Awards and Honors

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

Prog. Lang. MATLAB, Python, CUDA, C++

ML Libs Keras, Tensorflow

Others Git, LateX

Relevant Coursework

U.Graduate Linear Algebra, Probability and Statistical Inference, Stochastic Processes, Complex Analysis, Machine Learning, Parallel Computing.

Graduate Differential Geometry, Spectral Graph Theory, Convex Analysis and Optimization, Quantum Mechanics, Knot Theory, Topology.