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 - 4.00

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 new 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 Eigenmap*, 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. [Link]

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