Rohan Chandra

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RESEARCH INTERESTS

Non Convex Optimization, Theoretical Machine Learning.

EDUCATION

University of Maryland, College Park, MD, USA

- M.S. in Computer Science   Aug 2016 – May 2018
  - Cumulative GPA: 3.837 / 4.000
  - Relevant Courses: Optimization, Machine Learning, Linear Algebra, Probability and Statistics.

Delhi Technological University, New Delhi, India

- B.Tech. in ECE   Aug 2012 – May 2016

RESEARCH EXPERIENCE

Graduate Research Assistant, University of Maryland, College Park, MD, USA

- Developed Phasepack   Apr 2017 – Present
  - Phase Retrieval is an example of a non-convex quadratic program with quadratic constraints. In the real-valued case, it is a combinatorial problem which is known to be NP-hard. Despite this observation, recent years have seen the development of new algorithms that solve phase retrieval problems effectively. Unfortunately, because of the lack of publicly available real-world data, the lack of a common software interface for different algorithms, and a knowledge gap between practitioners and theoreticians, only little work has been devoted to compare and evaluate newer phase retrieval methods. **So we created Phasepack, a comprehensive library that compiles all the algorithms within a uniform interface.**

- Low Rank Matrix Recovery   Apr 2017 – Present
  - Another example of intractability associated with non-convexity is low rank matrix recovery with quadratic measurement constraints where a solution is obtained by lifting the problem to a higher parameter space. To elaborate, lifting expresses a system of quadratic measurements as a system of linear equations whose solution is a matrix that obeys a rank constraint. However, working with matrices instead of vectors in higher dimensions generally means incurring large storage costs. As part of my MS thesis I am trying to solve the problem of low rank matrix recovery from quadratic measurement constraints without lifting i.e. in the natural parameter space. We observed that Phasemax (Goldstein and Studor, 2016) solves phase retrieval by recovering solutions in the same space as the input without lifting to higher dimensions. Consequently it is a better alternative to current lifting solutions for solving semi-definite programs. **Initial sketches of my proof look promising and I am currently in the process of formalizing this.**

WORK EXPERIENCE

Intern, IIIT, New Delhi, India

- Swarath - The Driverless Car Project   Jan 2016 – Jun 2016
  - Helped design the lane detection algorithm for the perception module using ROS, C++, and OpenCV.
  - Implemented the localization and navigation algorithms used in the planning module.
  - Helped design India's first joystick enabled e-Rickshaw. Won the **first prize** in IIIT Delhi's Research Showcase in March 2016.

TEACHING EXPERIENCE

Graduate Teaching Assistant, University of Maryland, College Park, MD, USA

- Discrete Mathematics (Fall 2017)   Aug 2017 – Present
  - Leading Recitation Sections, Office Hours, Grading.
  - **Recognized as "best TA" with outstanding TA evaluations.**

- Introduction to Programming in Java (Spring 2017)   Jan 2017 – May 2017
  - Office Hours, Grading.

- Computer Networks (Fall 2016)   Aug 2016 – Dec 2016
  - Office Hours, Grading.

PUBLICATIONS

JOURNALS

[1] Arthur Benjamin, <u>Rohan Chandra</u>, "Multiplying by 9," *The College Mathematics Journal*, vol.47, no. 4, pp. 281, Sep 2016.

[2] Rashika Anurag, Neeta Pandey, <u>Rohan Chandra</u>, Rajeshwari Pandey, "Voltage Mode Second Order Notch/All - Pass Filter Realization Using OTRA," *i-Manager's Journal on Electronics Engineering*, vol. 6, no. 2, pp. 22–28, Dec 2015.

CONFERENCES

[3] <u>Rohan Chandra</u>, S Grover, K Lee, M Meshry, A Taha, "Texture Synthesis with Recurrent Variational Auto-Encoder," in *arXiv Preprint*, Dec 2017.

[4] <u>Rohan Chandra</u>, Ziyuan Zhong, Justin Hontz, Val McCulloch, Christoph Studer, Tom Goldstein, "Phasepack: A Phase Retrieval Library," submitted to *IEEE Proceedings of the 51st Asilomar Conference on Signals, Systems and Computers*, Asilomar, CA, USA, Nov 2017.

[5] <u>Rohan Chandra</u>, Ziyuan Zhong, Justin Hontz, Val McCulloch, Christoph Studer, Tom Goldstein, "Phasepack User Guide," in *arXiv Preprint*, Nov 2017.

ACHIEVEMENTS & STRENGTHS
- **Top Writer** on Quora in mathematical optimization category for December 2017.
- **State level** chess player.
- Speed math.
  - Published a number of techniques for speed arithmetic without paper and pencil.

PROFESSIONAL SERVICE

Dept of computer science, UMD
- Application Reviewer for graduate school admissions. 2016 – Present

TECHNICAL SKILLS

Python, MATLAB, LaTeX, Microsoft Office Suite.

INTERESTS

Chess, Academia, Mental Math.