

Parth K. Thaker

CONTACT INFORMATION	1215, E.Vista Del Cerro Dr., Apt.No. 2091 Tempe, Arizona, 85281	+4802410312 pkthaker@asu.edu parththaker.github.io
RESEARCH INTERESTS	Nonconvex Optimization, Online Learning (Bandits) and Probability.	
EDUCATION	Ph.D. candidate, Electrical Engineering, Arizona State University , Arizona, USA. <i>Expected: August 2023</i> <ul style="list-style-type: none">• GPA: 3.83/4 (As of 8 Semesters)• Advisor: Gautam Dasarathy M.Tech, Indian Institute of Technology, Madras , Chennai, India <i>May 2016</i> <ul style="list-style-type: none">• GPA: 8.19/10• Specialization: Communication• Advisor: Radha Krishna Ganti B.Tech, Indian Institute of Technology, Madras , Chennai, India <i>May 2015</i> <ul style="list-style-type: none">• GPA: 8.19/10• Department: Electrical Engineering• Minor: Systems• Advisor: Radha Krishna Ganti	
RESEARCH ARTICLES/ PUBLICATIONS	<ol style="list-style-type: none">Pure Exploration in Multi-armed Bandits with Graph Side Information <i>Thaker P., Rao N., Malu M., Dasarathy G.</i> <i>arXiv preprint arXiv:2108.01152</i> <p>The paper studies pure exploration in multi-armed bandits with inaccurate graph side-information. A novel algorithm GRUB (GRaph based UcB) is proposed and a theoretical characterization of its sample complexity performance is provided. The algorithm and bound elicits the benefit of the graph-side information (first of its kind!).</p>On the Sample Complexity and Optimization Landscape for Quadratic Feasibility Problems <i>Thaker P., Dasarathy G., Nedich A.</i> <i>IEEE International Symposium on Information Theory (ISIT), Jun. 20</i> <p>Thus paper considers the problem of recovering an unknown complex vector $\mathbf{x}^* \in \mathbb{C}^n$ through its random quadratic measurements. Sufficiency conditions for identifiability of \mathbf{x}^* are established which leads to isometric properties of the problem setup. Landscape properties for the nonconvex loss functions are established enabling first order algorithms to recover the unknown vector despite problem being non-convex (which typically would require access to second order oracle) with probability 1.</p>Differentiable Programming for Hyperspectral Unmixing using a Physics-based Dispersion Model <i>Janiczek J., Thaker P., Dasarathy G., Edwards C., Christensen P., Jayasuriya S.</i> <i>European Conference on Computer Vision (ECCV), Nov. 20</i> <p>In this paper, spectral variation is considered from a physics-based approach and incorporated into an end-to-end spectral unmixing algorithm via differentiable programming. The dispersion model is introduced to simulate realistic spectral variation, and an efficient method to fit the parameters is presented. Then, this dispersion model is utilized as a generative model within an analysis-by-synthesis spectral unmixing algorithm. Further, a technique for inverse rendering using a convolutional neural network to predict parameters of the generative model is introduced to enhance performance and speed when training data is available.</p>	

4. **Queuing Optimal WiFi Sensing**

*Thaker P., Gopalan A., Vaze R.
RAWNET, WiOpt, 2017*

When there is a queue of people trying to access a bandwidth shared Access Point, what should be the optimal strategy? To answer that we are using Game Theoretic concepts to come up with a learning algorithm to do the same.

5. **Factored gradient descent**

Advisor: Radha Krishna Ganti

Master's Thesis

Indian Institute of Technology, Madras

We analyze various properties of Frank-Wolfe type constrained Optimization algorithms on Reimannian Manifolds. We propose an alternate minimization approach for solving fixed rank matrix minimization optimization problems.

PROFESSIONAL
EXPERIENCE

1. Systems Engineer : Netradyne
Aug 2016 - May 2017
Bangalore, IN.
2. Intern : Securifi Systems Pvt. Ltd
May 2014-July 2014
Hyderabad, IN.
3. Intern : Cisco Systems Pvt. Ltd
May 2013-July 2013
Bangalore, IN.
4. Conference Volunteer : WiOpt, 2015
Mumbai, IN.

SOCIAL INITIATIVE

1. **Sahaay**
Worked closely with **NGO Vidhyasagar**, based in Chennai, to develop software to assist patients affected with Cerebral Palsy to have an independent life.

TEACHING
EXPERIENCE

1. Teaching Assistant : **EE5011: Computer Methods in Electrical Engineering**
Conducted By: Harishankar Ramachandran
2. Teaching Assistant : **EE6151: Advanced Topics in Networks**
Conducted By: Radha Krishna Ganti

GRADUATE
COURSES

- Statistical Machine learning
- Convex Optimization
- Real analysis
- Functional analysis
- Spectral graph theory
- Applied Time Series Analysis
- Multivariate Data Analysis
- Reinforcement Learning
- Information Theory
- Game Theory

SUMMER SCHOOLS
AND WORKSHOPS

1. **Recent Advances in Reinforcement Learning Workshop 2015**
Conducted By: National Mathematics Initiative
2. **Summer School on Machine Learning**
Conducted By: Microsoft Research, Bangalore
3. **Summer School on Applied Mathematics**
Conducted By: Indo-French Centre for Applied Mathematics
4. **Summer school on Information Theory**
Conducted By: Joint Telematics Group/IEEE Information Theory Society