

# DHEERAJ BABY

<https://dheeraj-b.github.io/home/>

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## RESEARCH INTERESTS

My research has been focused on developing **online learning** algorithms that can optimally cope with non-stationarities present in the environment. A common thread in my research involves reducing problems from general statistics / ML literature to ones that can be solved by online learning in a data-efficient manner. Applications of my work include forecasting trends in Time Series, dynamic pricing, design of adaptive real-time controllers for LQR systems, building recommender systems, signal processing etc.

## EDUCATION

### University of California, Santa Barbara

PhD student, Department of Computer Science

October 2018 - present

Advisor: [Yu-Xiang Wang](#)

- CGPA : 4.0/4.0

### Indian Institute of Technology Madras, Chennai, India

July 2011 - June 2016

Dual Degree, Department of Electrical Engineering

*Bachelor of Technology*, Electrical Engineering

*Master of Technology*, Microelectronics & VLSI

## PUBLICATIONS

**Dheeraj Baby\***, Jianyu Xu\* and Yu-Xiang Wang, "*Non-stationary Contextual Pricing with Safety Constraints*", in Transactions of Machine Learning Research (**TMLR**) 2022 (\*Equal contribution).

**Dheeraj Baby** and Yu-Xiang Wang, "*Optimal Dynamic Regret in LQR Control*", in Proceedings of 36th Conference on Neural Information Processing Systems (**NeurIPS**) 2022.

**Dheeraj Baby** and Yu-Xiang Wang, "*Optimal Dynamic Regret in Proper Online Learning with Strongly Convex Losses and Beyond*", in Proceedings of 25th International Conference on Artificial Intelligence and Statistics (**AISTATS**) 2022.

**Dheeraj Baby** and Yu-Xiang Wang, "*Optimal Dynamic Regret in Exp-Concave Online Learning*", in Proceedings of 34th Annual Conference On Learning Theory (**COLT**) 2021. (**Best student paper award**)

**Dheeraj Baby**, Xuandong Zhao and Yu-Xiang Wang, "*An Optimal Reduction of TV-Denoising to Adaptive Online Learning*", in Proceedings of 24th International Conference on Artificial Intelligence and Statistics (**AISTATS**) 2021.

**Dheeraj Baby** and Yu-Xiang Wang, "*Adaptive Online Estimation of Piecewise Polynomial Trends*", in Proceedings of 34th Conference on Neural Information Processing Systems (**NeurIPS**) 2020.

**Dheeraj Baby** and Yu-Xiang Wang, "*Online Forecasting of Total-Variation-bounded Sequences*", in Proceedings of 33rd Conference on Neural Information Processing Systems (**NeurIPS**) 2019.

## PATENTS

Jason R. Baumgartner, Robert L. Kanzelman, Pradeep Kumar Nalla, Raj Kumar Gajavelly, **Dheeraj Baby**, "*Initial-state and next-state value folding*", US Patent# US10621297B1

## AWARDS

**Best student paper award** at 34th Annual Conference On Learning Theory (COLT) 2021

**Outstanding publication award** 2021, from department of Computer Science, University of California Santa Barbara

**Top 33% reviewer award** at 37th International Conference on Machine Learning (ICML) 2020

**Best paper honorable mention** at Time Series workshop in ICML 2019

INVITED TALKS

**Optimal Dynamic Regret in Exp-Concave Online Learning**, at 34th Annual Conference On Learning Theory (COLT) 2021

**Online Forecasting of Total-Variation-bounded Sequences** at International Conference on Machine Learning (ICML) 2019 Time Series workshop

INDUSTRIAL  
EXPERIENCE

Student Researcher, **Google Research** India, Machine Learning and Optimization group, Jun 2022 - Sept 2022

Applied Scientist Intern, **AWS AI Labs** Palo Alto, Time Series forecasting group, Jun 2020 - Sept 2020

Software Developer, **IBM** India, 2016-2018

ACADEMIC  
SERVICE

Reveiwer for ICML19,20,21, AISTATS22,23, JMLR21,22

PROGRAMMING  
LANGUAGES

C++, Python, Keras, PyTorch

MISCELLANEOUS

In my free time, I enjoy running, swimming, playing tennis and reading Gita.