

ANUPAMA NANDI

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Research Interest

Differential Privacy, Privacy Preserving Learning, Optimization, Adaptive Data Analysis and Algorithms.

Publications

- Raef Bassily, Cristobal Guzman, and Anupama Nandi. Non-euclidean differentially private stochastic convex optimization. In *Conference on Learning Theory, COLT*, 2021
- Raef Bassily, Shay Moran, and Anupama Nandi. Learning from mixtures of private and public populations. In *Neural Information Processing Systems, NeurIPS*, 2020
- Anupama Nandi and Raef Bassily. Privately answering classification queries in the agnostic PAC model. In *Algorithmic Learning Theory, ALT*, 2020
- Joseph Anderson, Navin Goyal, Anupama Nandi, and Luis Rademacher. Heavy-tailed analogues of the covariance matrix for ICA. In *Association for the Advancement of Artificial Intelligence, AAAI*, 2017
- Joseph Anderson, Navin Goyal, Anupama Nandi, and Luis Rademacher. Heavy-tailed independent component analysis. In *Foundations of Computer Science, FOCS*, 2015

Professional Positions

Visiting Graduate Student, Simons Institute for the Theory of Computing

Berkeley, CA

- Participated in the program Data Privacy: Foundations and Applications

Jan 2019-May 2019

Graduate Research Assistant, The Ohio State University

Columbus, OH

- Worked on addressing fundamental limitations in differentially private machine learning
- Worked on Heavy-tailed independent component analysis.

Aug 2018-Present

Jan 2015-Dec 2016

Assistant System Engineer, Tata Consultancy Services

Chennai, India

- Developed an *EDI Vendor Management web application* as a part of a 7 member team
- Awarded *best team* for successful implementation of Vendor EDI application
- Led a 3 member team to implement an application to maintain details about batteries being used in the Data warehouse.

Dec 2009 – July 2011

Education

The Ohio State University

Columbus, OH

Ph.D. in Computer Science and Engineering

Advisor: Luis Rademacher

Aug 2013 - Dec 2017

Advisor: Raef Bassily

May 2018 - May 2022

Indian Institute of Technology Guwahati

Assam, India

Master of Technology (Computer Science) – CGPA : 8.64 /10.00

July 2011 - May 2013

Thesis: Implementation and Analysis of Minimum Spanning Tree in External Memory

Advisor: G. Sajith

G. H. Patel College of Engineering & Technology

Gujarat, India

Bachelor of Engineering (Computer Science) – CGPA : 9.49 /10.00

July 2005 - July 2009

Course Projects

Implementation of Private Learning via Stability

Jan - May 2018

Instructor: Raef Bassily

- Analyzed the performance of binary and multiclass classification algorithms using the sparse vector technique and sub-sample aggregate method as proposed in the paper Model-Agnostic Private Learning

Orthogonalization via the centroid body

Jan-May 2016

Instructor: Luis Rademacher

- Using Minkowski sum and linear programming tested membership for a centroid body to approximate an orthogonalization matrix.

Set Cover Implementation

Jan-May 2015

Instructor: Anastasios (Tasos) Sidiropoulos

- Implemented the set cover problem using Python and PuLP package on Frequent Itemset Mining Dataset Repository.
- Compared the performance of the greedy algorithm with the **linear programming relaxation**.

Logistic regression classifier for prediction of seizures

Aug-Dec 2014

Instructor: Brian Kulis

- Trained a logistic regression classifier in order to predict seizures from a number of EEG features.
- Main goal was to differentiate between the preictal and interictal states from the EEG data of patients and dogs of naturally occurring epilepsy.

Conferences & Workshops

Presenter

- Conference on Learning Theory 2021, Boulder, USA
- Algorithmic Learning Theory (ALT) 2020, San Diego, USA

Attendee

- Information Theory and Applications (ITA) Workshop 2020, San Diego, USA
- Data Privacy: Foundations and Applications program (2019), Simons Institute, Berkeley, CA, USA
- Foundations of Computer Science 2015, Berkeley, CA, USA

External Reviewer

- ALT2021, ALT2020, CCS19

Computer Software and Skills

Proficient: C, C++, Python, Java

Basic: MATLAB (optimization toolkit, Gurobi plugin), Mathematica, SQL, PL/SQL

Graduate Coursework

Privacy-Preserving Data Analysis, Optimization, Machine Learning and Statistical Pattern Recognition, Theory of Probability, Advanced Algorithms, Probability for Statistical Inference, Survey of Artificial Intelligence II: Advanced Techniques, Computability and Complexity, Computational Topology and Data Analysis

Teaching Experience

The Ohio State University

Columbus, OH

- Teaching Assistant, Machine Learning and Statistical Pattern Recognition *Aug 2020-Dec 2021*
- Teaching Assistant, Machine Learning and Statistical Pattern Recognition *Aug 2018-Dec 2018*
- Teaching Assistant, Foundations II: Data Structures and Algorithms *Aug 2018-Dec 2018*
- Teaching Assistant, Modeling and Problem Solving with Spreadsheets and Databases *Jan 2017-Dec 2017*
- Teaching Assistant, Foundations of Programming Languages *Aug 2014-Dec 2014*
- Teaching Assistant, Systems II: Introduction to Operating Systems *Aug 2013-May 2014*

Awards & Activities

- **Literary Secretary** of IIT Hostel (2012-2013): Organized debates, blogging and other intra-hostel events.
- **Technical Coordinator** of CSE department (2007-2009): Organized various project competitions and helped in providing facilities to students for making their projects.
- Graduated with rank 2 from the Computer Science department at G. H. Patel College of Engineering & Technology in 2009. Received scholarships for outstanding performance during academic years 2005-06 and 2006-07
- Secured 2nd position as a part of a team in the poster presentation competition in Prakarsh 2007 (technical festival: state level) held at SVIT, Vasad.