

# Anand D. Sarwate

# Curriculum Vitæ

## CONTACT INFORMATION

Assistant Professor

Department of Electrical and Computer Engineering  
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## RESEARCH INTERESTS

I am broadly interested in statistical algorithms and methods applied to problems in distributed systems, communications, and privacy and security.

## EDUCATION

- 1/06–7/08      **University of California, Berkeley**, (Berkeley, California USA)  
Ph.D., Electrical Engineering and Computer Sciences (awarded 12/2008)  
Designated Emphasis in Communication, Computation and Statistics  
Thesis: *Robust and adaptive communication under uncertain interference*  
Advisor: Professor Michael Gastpar
- 8/02–12/05      **University of California, Berkeley**, (Berkeley, California USA)  
M.S., Electrical Engineering and Computer Sciences (awarded 12/2005)  
Thesis : *Observation uncertainty in Gaussian sensor networks*  
Advisor: Professor Michael Gastpar
- 9/97–6/02      **Massachusetts Institute of Technology**, (Cambridge, Massachusetts USA)  
B.S., Electrical Engineering and Computer Science (awarded 6/2002)  
B.S., Mathematics (awarded 6/2002)  
Minors in Music and Theater Arts

## EMPLOYMENT

- 1/14–present      **Rutgers, The State University of New Jersey**, (Piscataway, New Jersey USA)  
*Assistant Professor*
- 10/11–12/13      **Toyota Technological Institute at Chicago**, (Chicago, Illinois USA)  
*Research Assistant Professor*
- 9/08–9/11      **University of California, San Diego**, (La Jolla, California USA)  
*Postdoctoral Researcher*  
Supervisors: Professors Alon Orlitsky, Tara Javidi, and Young-Han Kim

## CURRENT RESEARCH SUPPORT

- NSF      [SaTC-1617849] **TWC: Small: PERMIT: Privacy-Enabled Resource Management for IoT Networks** This proposal studies how privacy, utility, and bandwidth affect each

other in networked data collection and information processing systems. PI: Anand D. Sarwate, Co-PI: Narayan Mandayam: \$500,000.00

- DARPA/Navy [N66001-15-C-4070] **Jana: Ensuring Secure, Private and Flexible Data Access** This project is about building a secure database system that uses secure multiparty computing and privacy-preserving algorithms to hold and process queries on data held by multiple parties. PI: David Archer (Galois, Inc.), subcontract to Rutgers (PI: Rebecca Wright, co-PIs: Anand D. Sarwate, David Cash): \$1,013,723
- NSF [CCF-1453432] **CIF: Small: Active data screening for efficient feature learning** This proposal develops methods for screening samples to use for dictionary learning algorithms to balance representation accuracy and computational efficiency. PI: Waheed Bajwa, Co-PI: Anand D. Sarwate: \$160,000.00
- NIH [1R01DA040487-01A1] **COINSTAC: Decentralized, Scalable Analysis of Loosely Coupled Data** This proposal is to develop a system for automated and privacy-sensitive statistical analyses of data from neuroimaging researchers studying the same condition at different sites. PI: Vince Calhoun, subcontract to Rutgers (PI: Anand D. Sarwate): \$692,575.00 (estimated)
- NSF [CCF-1453432] **CAREER: Privacy-preserving learning for distributed data** This proposal develops key design principles for making practical privacy-preserving distributed learning algorithms and validate them in collaboration with neuroimaging researchers. The results will identify new challenges for information processing and machine learning in general distributed systems. PI: Anand D. Sarwate: \$540,000.00
- NSF [CCF-1218331] **Inference by social sampling.** This work investigates communication and networking paradigms that can enable a network of individual agents to collaboratively estimate distributions over high dimensional spaces, even when individual observations are severely limited in accuracy, space, or time. Co-PIs Anand D. Sarwate, Tara Javidi (UCSD): \$208,426

#### PAST RESEARCH SUPPORT

- Versign Gift through DIMACS Center to work on applied and theoretical privacy. PIs: Rebecca Wright, Anand D. Sarwate: \$25,000
- DHS **DPAD: Differentially Private Anomaly Detection** [Subcontract to CICCADA] This work seeks to understand how and when we can safely detect anomalies in private data. PIs: Rebecca Wright, Anand D. Sarwate: \$125,000
- ARL [CTA on Robotics] **Active Feature Learning and Classifier Training for Object Recognition** : developing active learning approaches for feature learning for object recognition in rich data such as video. Subaward from General Dynamics. Joint proposal with Waheed Bajwa and Athina Petropulu (Rutgers): \$125,526
- AcademyHealth [EDM Forum] **Review of Technologies to Protect Patient Privacy When Sharing Data for Comparative Effectiveness Research** : commissioned paper for a review of privacy-preserving methods for sharing data for medical research. Joint proposal with Lucila Ohno-Machado and Xiaoqian Jiang (UCSD): \$5,000

## PREPRINTS

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## JOURNAL

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## EXTENDED ABSTRACTS

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## THESES

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## TUTORIALS

12/14                    *Differential privacy and machine learning* (with K. Chaudhuri), tutorial at IEEE Workshop on Information Forensics and Security (WIFS)

## INVITED WORKSHOPS

8/09                    American Institute of Mathematics Workshop on Permanents and modeling probability distributions

5/10                    2010 IEEE Communication Theory Workshop

10/11                   BIRS Workshop on Information theory and statistics for large alphabets

2/10–2/12            ITA Workshop, UC San Diego

10/11–10/12        iDASH Privacy Workshop, UC San Diego

10/12                   DIMACS Workshop on Recent Work on Differential Privacy across Computer Science

12/13                   Simons Institute for Theoretical Computer Science Workshop on Big Data and Differential Privacy

3/15                    BIRS Workshop Between Shannon and Hamming: Network Information Theory and Combinatorics

5/15                    Big Data Analytics for Health Care: Differential Privacy, University of Delaware

9/16                    Google Learning, Privacy, and Mobile Data Workshop, Seattle, WA

4/17                    DIMACS/Northeast Big Data Hub Workshop on Privacy and Security for Big Data

5/17                    Simons Institute for Theoretical Computer Science Workshop on Data Privacy, Berkeley, CA

- 5/17 Simons Institute for Theoretical Computer Science Workshop on Data Privacy, Berkeley, CA
- 8/17 DIMACS Workshop on Distributed Optimization, Information Processing, and Learning

#### RECENT TALKS

- 7/17 *Between Shannon and Hamming: The Impact of Delay*, École Polytechnique Fédéral de Lausanne (EPFL), and Technical University of Vienna (TU-Wien)
- 5/17 *Challenges in Privacy-Preserving Learning for Collaborative Research Consortia*, Simons Institute for Theoretical Computer Science Planning Workshop on Data Privacy
- 4/17 *Privacy Protections as an Incentive for Collaborative Research on Human Health*, DIMACS/Northeast Big Data Hub Workshop on Privacy and Security for Big Data
- 4/16,5/16 *Differential Privacy in Distributed Systems*, Harvard University EE Seminar, CUNY Graduate Center
- 11/15 *Privacy-Protecting Technologies for Collaborative Research*, Christiana Care CME Series
- 4/15,6/15 *Learning From Distributed Private Data: Algorithms and Applications*, NYU-Poly (April), National Chiao Tung University (June)
- 5/15 *The role of differential privacy in collaborative healthcare research*, University of Delaware ACCEL Retreat

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- 2009–2014 Online Associate Editor, IEEE Information Theory Society
- 2007–2009 IEEE Information Theory Society Ad Hoc Committee on Online Content and Services
- 10/08–12/10 IEEE Information Theory Society Student Committee
- 9/08–8/09 UCSD Information Theory and Applications Seminar organizer
- 8/05–8/07 UC Berkeley Networking, Communications, and DSP Seminar organizer

#### UNIVERSITY SERVICE

- 2015–Present Strategic Planning Committee for Douglass Residential College, Rutgers

## PROGRAM COMMITTEES

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IEEE International Workshop on Machine Learning for Signal Processing (MLSP 2017)

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IEEE International Workshop on Machine Learning for Signal Processing (ITW 2017)

IEEE Information Theory Workshop (ITW 2015, 2017) - TPC

IEEE International Symposium on Information Theory (ISIT 2017)

Institut Henri Poincaré Program on the Nexus of Information and Computation Theories, 2016

IEEE International Conference on Distributed Computing in Sensor Networks (DCOSS 2012, 2013, 2015) - TPC

Sixth International Conference on Information-Theoretic Security (ICITS 2012) - TPC

IEEE Vehicular Technology Conference (VTC) 2011 - TPC

IEEE ICC Wireless Communications Symposium 2010 - TPC

Information Theory and Applications Workshop 2009-2013 - Organizing Committee

## PEER REVIEWING

IEEE Transactions : Information Theory, Signal Processing, Automatic Control, Communications, Wireless Communications, Vehicular Technology, Computational Biology and Bioinformatics, Parallel and Distributed Systems, Smart Grid, Network Science and Engineering, Signal and Information Processing over Networks

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IEEE/ACM Transactions on Networks

ACM Transactions on Sensor Networks

Problems of Information Transmission

Journal of Machine Learning Research (JMLR)

Journal of the American Statistical Association (JASA)

Random Structures and Algorithms

Statistical Science

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EURASIP Journal on Wireless Communications and Networking

Queueing Systems : Theory and Applications

AMS Mathematical Reviews

*Conferences* : ISIT (2007–2016), Globecom (2007, 2009), GlobalSIP (2016, 2017), PIMRC (2007), ITW (2008,2010,2013-2014), CDC (2009,2012), STOC (2010), COLT (2011, 2012), Infocom (2012), ICC (2012), AISTATS (2012, 2013), ICML (2012–2016), NIPS (2012–2016), ACC (2013), SODA (2015), GlobalSIP (2016–2017), AISTATS (2016–2018), ICASSP (2017–2018), CAMSAP (2017)

## HONORS AND AWARDS

NSF CAREER Award, 2015

NIPS Reviewer Award, 2013

Demetri Angelakos Memorial Achievement Award, UC Berkeley Department of EECS, 2008

Samuel Silver Memorial Scholarship Award, UC Berkeley Department of EECS, 2007

National Defence Science and Engineering Graduate Fellowship, 2002–2005

MIT : Laya and Jerome B. Wiesner Student Art Award, Joseph Everingham Award (Theater), Philip Lowe Memorial Award (Music)

MEMBERSHIPS    IEEE, Phi Beta Kappa, Eta Kappa Nu

October 28, 2017