

# ANANT GUPTA

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## EDUCATION

<b>University of California, Santa Barbara, USA</b>	G.P.A. 4.0/4.0	2014-2020
Department of Electrical and Computer Engineering (ECE)		
PhD in ECE, Research Focus: Wireless Sensing		03/20/2020
MS in ECE, Major: Communications and Signal Processing		12/09/2016
<b>IIT Kharagpur, India</b>	G.P.A. 8.45/10	2008-2013
Bachelor of Technology (Honors) in Electronics and Electrical Communication Engineering		07/27/2013
Master of Technology (Dual Degree) – Telecommunication Systems Engineering		07/27/2013

## INDUSTRY EXPERIENCE

<b>Qualcomm Inc., San Diego, USA:</b> Senior Engineer, Modem Systems	2020-Present
<ul style="list-style-type: none"><li><i>Smart Transmit Project</i> (Jan 2023 - Current) Developed power control algorithms to improve efficiency of 5G Up-link transmission systems.</li><li><i>FMCW Radar Project</i> (June 2020 - Jan 2023) Designed radar detection algorithms in DSP for close proximity detection in mobile devices.</li></ul>	
Interim engineering intern <i>Algorithm design for range detection &amp; mutual coupling cancellation in 5G NR terminals.</i>	Summer 2017
<b>Stealth Startup, San Francisco Bay Area, USA:</b> Engineering Intern <i>Perception for Autonomy</i>	Summer 2019
Explored state of the art signal processing algorithms for sensing and imaging applications in the RF domain. Benchmarking and proposing new system level solutions and features.	
<b>National Instruments R&amp;D, Bangalore, India:</b> RF Algorithm Software Engineer <i>Baseband signal processing algorithm design for OFDM-MIMO based 802.11n/ac WLAN.</i>	2013-2014
<i>Physical layer design for a NFC transmitter on FPGA.</i> Intern	Summer 2012
Developed RF interface for testing NFC tags using NI RIO hardware and tested TX signals using Agilent MXA.	
<i>FPGA-PC hybrid implementation of fractional re-sampler for NI GPS toolkit.</i> Intern	Summer 2011
Reduced the latency of generating composite GPS signals by resampling using polyphase filter banks on FPGA.	

## RESEARCH EXPERIENCE

<b>University of California, Santa Barbara, USA:</b> Doctoral Research <i>Sensing and Inference using low cost mm-wave systems.</i> PhD Advisor: U. Madhow	2015-2020
<ul style="list-style-type: none"><li>Geometry-Assisted data association for instantaneous localization with distributed millimeter wave sensors.</li><li>Multi-objective optimization to construct large-effective aperture antennas using sparse array of subarrays.</li><li>Enhanced accuracy and Super-Resolution algorithms for 2D FMCW radar systems.</li></ul>	
<b>IIT Kharagpur, India:</b> Masters Research <i>Energy efficient MAC protocols for wireless sensor networks.</i> Advisor: R Datta	2011-2013
<ul style="list-style-type: none"><li>Designed energy efficient contention resolution protocols (SMAC) for centralized &amp; ad-hoc sensor networks.</li><li>Analyzed performance using a Discrete time Markov chain model and validated with simulations in NS2.</li></ul>	

## PUBLICATIONS

- **A. Gupta** and U. Madhow, “Multi-Sensor Spatial Association Using Joint Range-Doppler Features”, IEEE Transactions on Signal Processing, 2021.
- **A. Gupta** (2020). Geometric Simplification of Optimization Problems in Millimeter-Wave Sensing. eScholarship, University of California.
- **A. Gupta**, U. Madhow, A. Arbabian and A. Sadri, “Design of Large Effective Apertures for Millimeter Wave Systems using a Sparse Array of Subarrays”, IEEE Transactions on Signal Processing, 2019.
- **A. Gupta**, U. Madhow, A. Arbabian and A. Sadri, “On beam design for sparse arrays of subarrays using multi-objective optimization and estimation-theoretic criteria”, 51st Asilomar Conference on Signals, Systems and Computers, 2017, Pacific Grove, USA.
- **A. Gupta**, U. Madhow, and A. Arbabian, “Super-resolution in position and velocity estimation for short-range mm wave radar”, 50th Asilomar Conference on Signals, Systems and Computers, 2016, Pacific Grove, USA.

## REVIEW WORK

<b>Expert Peer Reviewer</b>	Reviewed 11 journal manuscripts for IEEE Transactions on Signal Processing (IF:5.4)	Feb 2019-Jan, 2024
	Reviewed 3 journal manuscripts for IEEE Transactions on Communications (IF:8.3)	Dec, 2022-April, 2023
	Reviewed 2 journal manuscripts for the IEEE Sensors Journal (IF:4.3)	July-October, 2022
<b>Teaching Assistant</b>	Digital Communication course & lab, UCSB	Oct, 2014-March 2015
	Basic Electronics Lab, IIT Kharagpur	Jan-April, 2013
	Basic Network theory lab, IIT Kharagpur	July-Nov, 2012
<b>Technical Head, Anadigix</b>	Circuit design competition at IIT Kharagpur	January, 2011
<b>Science Project Advisor</b>	Partners in Education, Santa Barbara	October, 2018

## PATENTS

- E.Y. Imana, R. Rimini, U. Fernando, W.H. She, and **A. Gupta**, “Robust Motion-based Human Proximity Sensor using Short-Range Radar”, U.S. Patent 11,394,417, issued July 19, 2022.
- R. Rimini, **A. Gupta**, “Proximity detection using adaptive mutual coupling cancellation”, U.S. Patent 10,871,549, issued December 22, 2020.
- S.M. Taleie, C. Jiang, D. Seo, U. Fernando, S. Patel, R. Rimini, and **A. Gupta**, “Programmable multi-mode digital-to-analog converter (DAC) for wideband applications”, U.S. Patent 10,663,572, issued May 26, 2020.
- **A. Gupta**, R. Rimini, S. Tu, A. Zoubi, and N. Ramalingam, “Noise estimation with signal ramps for Radar”, U.S. Patent App. 17/649,259 .
- A. Zoubi, **A. Gupta**, S. Tu, R. Rimini, and N. Ramalingam, “FMCW radar detection in the presence of phase noise”, U.S. Patent App. 17/649,759.
- *Five additional inventions are pending patent application.*

## RESEARCH FUNDING (for Doctoral research at UCSB)

- Center for Converged TeraHertz Communications and Sensing (ComSenTer), one of six centers in JUMP, a Semiconductor Research Corporation (SRC) program sponsored by DARPA.
- National Science Foundation under Grants CNS-1518812, CNS-1518632 and CNS-1725797.
- Systems on Nanoscale Information fabriCs (SONIC), one of the six SRC STARnet Centers, sponsored by MARCO and DARPA.

## TECHNICAL SKILLS

<i>Programming Languages:</i>	MATLAB, Python ( <i>fluent</i> ), C/C++ ( <i>past experience</i> )
<i>Engineering Tools:</i>	PyTorch, LabVIEW, QXDM, NS-2 ( <i>past experience</i> )

## ACADEMIC DISTINCTIONS

Secured All India Rank of 962 ( $< 0.27\%$ ) in IIT-Joint Entrance Examination 2008.

Secured All India Rank of 217 ( $< 0.1\%$ ) in Graduate Aptitude Test in Electrical Engineering 2013.

## COURSE PROJECTS

*Truth-telling in Non-Monetary Mechanisms*

Fall 2018

- Investigated non-monetary mechanisms which utilize repeated games to extract truth from agents.

*Multi-Agent Reinforcement Learning*

Fall 2015

- Investigated algorithms for learning and sequential decision making using Markov Decision Processes.

*Machine learning approaches for Natural Language Processing*

Spring 2015

- Investigated the most informative features for use in Named Entity Recognition task.
- Evaluated the accuracy on the Spanish news text classification task of CoNLL 2002.

*Massive MIMO Detection Algorithms.*

Winter 2015

- Investigated low complexity detection algorithms for Massive MIMO systems.

## GRADUATE COURSEWORK

Matrix Analysis & Computations

Digital Communication Theory

Optimal Estimation & Filtering

Stochastic Processes in Engineering

Adaptive Filter Theory

Machine Learning

Data Structures & Object Representation

Pattern Recognition

Game Theory

Error Correction Codes