

# Vipul Gupta

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University of California, Berkeley

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## Education

2016-Present **University of California, Berkeley.**

Ph.D. in *Electrical Engineering and Computer Sciences (EECS)*

GPA: 3.95/4

*Advisors:* Kannan Ramchandran and Thomas Courtade

*Research interests:* Large-scale machine learning, Randomized Computation, Information Theory

2015-2016 **Indian Institute of Technology Kanpur, India.**

Master of Technology in *Electrical Engineering*

GPA: 9.7/10

*Advisors:* Ajit K. Chaturvedi and Ketan Rajawat

2011-2015 **Indian Institute of Technology Kanpur, India.**

Bachelor of Technology in *Electrical Engineering* with distinction

GPA: 9.0/10

Minors in *Computer Science*

## Publications

- 2020 **V. Gupta\***, D. Carrano\*, Y. Yang, V. Shankar, T. Courtade, K. Ramchandran, "Serverless Straggler Mitigation using Local Error-Correcting Codes" Under review. [[pdf](#)] .
- 2020 **V. Gupta**, S. Akle and D. DeCoste, "Stochastic Weight Averaging in Parallel: Large-batch Training that Generalizes Well", International Conference on Learning Representations (ICLR), Ethiopia, 2020 [[pdf](#)] .
- 2019 **V. Gupta**, S. Kadhe, T. Courtade, M. Mahoney and K. Ramchandran, "OverSketched Newton: Fast Convex Optimization for Serverless Systems", Spotlight Presentation, International Conference on Machine Learning (ICML) Workshop 2019, Long Beach, USA. [[pdf](#)] [[code](#)] .  
(Longer version currently under review)
- 2018 **V. Gupta**, S. Wang, T. Courtade and K. Ramchandran, "OverSketch: Approximate Matrix Multiplication for the Cloud", In *Proc. of the IEEE International Conference on Big Data* 2018, Seattle, WA, USA. [[pdf](#)] [[code](#)] .
- 2017 J. Zhu, Y. Pu, **V. Gupta**, C. Tomlin, and K. Ramchandran, "A sequential approximation framework for coded distributed optimization," In *IEEE 55th Annual Allerton Conference Communication, Control, and Computing (Allerton)*, 2017. [[pdf](#)]
- 2017 S. Kafle, **V. Gupta**, B. Kailkhura, T. Wimalajeewa and P. K. Varshney, "Joint Sparsity Pattern Recovery with 1-bit Compressive Sensing in Distributed Sensor Networks," in *IEEE Transactions on Signal and Information Processing over Networks*. [[pdf](#)]
- 2017 **V. Gupta**, S. S. Kalamkar and A. Banerjee, "On Secure Communication Using RF Energy Harvesting Two-Way Untrusted Relay," *IEEE Global Communications Conference (GLOBECOM)*, Singapore, 2017. [[pdf](#)] .
- 2016 **V. Gupta**, A. K. Sah and A. K. Chaturvedi, "Iterative Matrix Inversion Based Low Complexity Detection in Large/Massive MIMO Systems", accepted for publication in *IEEE International Conference on Communications (ICC) Workshops* 2016, Kuala Lumpur, Malaysia. [[pdf](#)].
- 2016 C. Aprile, L. Baldassarre, **V. Gupta**, J. Yoo, M. Shoaran, Y. Leblebici and V. Cevher, "Learning-based near-optimal area-power trade-offs in hardware design for neural signal acquisition," in *ACM Inter. Conf. on Green Lakes Symp. on VLSI (GLSVLSI)* 2016, Boston, USA. [[pdf](#)]

- 2015 **V. Gupta**, B. Kailkhura, T. Wimalajeewa and P. K. Varshney, "Joint Sparsity Pattern Recovery with 1-bit Compressive Sensing in Sensor Networks", in *Proc. of the Asilomar Conference on Signals, Systems, and Computers* 2015, Pacific Grove, CA, USA. [pdf].

Google scholar profile: [Vipul Gupta](#)

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## Honors and Awards

- 2016 Awarded a one-year **Graduate Fellowship** by the department of EECS at UC Berkeley
- 2015 Awarded **EPFL-IIT** summer-intern scholarship for excellent research and academic background
- 2013 Selected for **SURGE'13** summer research program, awarded to only 100 students across India
- 2013 **Academic Excellence Award** 2011-12 recipient, awarded to top 5% students at IIT Kanpur
- 2011 Secured **All India Rank 464** (in 4,75,000 students) in IIT-JEE 2011 (Top 0.1%)
- 2011 Secured **All India Rank 63** (in 10,00,000 students) and State Rank 3 in AIEEE'11 (Top 0.01%)
- 2010 Selected among **Top 1%** students in National Physics Olympiad 2010 in the state of Rajasthan
- 2011-15 Awarded **Shanti and Ramkishore Sahai Saxena Memorial Scholarship** for being in good academic standing throughout the stay at IIT Kanpur

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## Experience

- May–Aug'19 **Accelerating Training of Deep Neural Networks**, *AI Research, Apple, Cupertino*.  
Manager : Dennis DeCoste  
*Objective*: To reduce the time to train deep neural networks across multiple GPUs by tackling challenges such as generalization drop due to large-batch training.
- Aug'16– **Accelerating Machine Learning for the Cloud**, *Graduate Student Researcher, UC Berkeley*.  
Present Advisors : Kannan Ramchandran and Thomas Courtade  
*Objective*: Develop principled approaches to accelerate distributed computation in cloud computing by leveraging ideas from randomized numerical linear algebra and coding theory.
- Dec'17– **Fault Tolerance for Distributed Computation in Apache REEF**, *Microsoft Research India*.  
Jan'18 Manager : Harsha Vardhan Simhadri  
*Objective*: Explore the use of error-correcting codes for efficient straggler mitigation schemes for basic distributed linear algebra and machine learning algorithms in Apache REEF.
- Aug'15– **Resource Allocation in Massive MIMO Systems**, *M.Tech Thesis, IIT Kanpur*.  
June'16 Advisors : Ajit Kumar Chaturvedi and Ketan Rajawat  
*Objective*: Solve for resource allocation in massive MIMO, that deals with a number of problems including power control, subcarrier selection, and division of time-frequency resources.
- May–July'15 **Fast Structure Aware Sampling**, *Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland*.  
Advisor : Prof. Volkan Cevher  
*Objective*: To select minimum number of components from the Hadamard transform of the input signal to facilitate efficient recovery of the input signal with state-of-the-art performance results.
- May–July'14 **Joint Support Recovery with 1-bit Compressive Sensing**, *Syracuse University, NY, USA*.  
Advisor : Prof. Pramod K. Varshney  
*Objective*: To solve the problem of sparse support recovery with 1-bit quantized compressive measurements in the presence of multiple sensors.
- May–July'13 **Low Complexity Sphere Decoding in MIMO Systems**, *SURGE, IIT Kanpur, India*.  
Advisor : Prof. Ajit K. Chaturvedi  
*Objective*: To devise a low complexity sphere decoding algorithm for MIMO Systems with theoretical guarantees on its accuracy.

## Leadership

- 2019-Present **Co-organizer**, *BLISS Seminar, UC Berkeley*.  
Contact and invite distinguished researchers from universities and industry to give a talk at the Berkeley Laboratory for Information and System Sciences (BLISS) Seminar. Also involves publicizing the event across different departments in the campus.
- 2014-15 **Company Relations Team**, *Students Placement Office, IIT Kanpur*.  
Contacted and persuaded HRs from different companies to visit campus for recruitment of students. Involved in dissemination of regular updates on current market trends and how they may shape hiring opportunities in the future.
- 2013-14 **Manager**, *Techkriti Grand Prix (TGP)*, Techkriti'14, IIT Kanpur.  
Conceptualized and organized the racing event TGP which saw participation from 40 teams all over the country. Worked with a three-tier team of 50 coordinators and secretaries and around 60 workers.
- 2012-13 **Coordinator**, *Electronic Circuit Design Competition*, Techkriti'13, IIT Kanpur.  
Designed and validated the problem statement of electronics competition, and popularized the event among other college students by creating ambassadors in outside colleges, and fetched a participation of more than 300 students for the event.

## Teaching

- Fall'19 **Graduate Student Instructor**, **EE229A**, *Information and Coding Theory*, UC Berkeley.
- Spring'19 **Graduate Student Instructor**, **EECS126**, *Probability and Random Processes*, UC Berkeley.
- Fall'16 **Teaching Assistant**, **EE320**, *Principles of Communications*, IIT Kanpur.
- Spring'15 **Teaching Assistant**, **EE380A**, *Control Systems Lab*, IIT Kanpur.