

# Subarna Chatterjee *February 27, 1990*

Post-Doctoral Researcher • Harvard University • USA

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## RESEARCH SUMMARY

I work on improving the performance of modern **data systems** by reasoning about the **read-write** tradeoff of the underlying **data structures and algorithms**. The longer-term goal of my research is to design and build **instance-optimized data systems** that can **self-design** themselves to create a tailored solution for the problem at hand. Toward this, I have explored the self-designing potential of **NoSQL storage engines on cloud** by constructing the **design and performance space** for different application contexts.

## WORK EXPERIENCE

### Post-Doctoral Fellow, [Harvard University](#)

Jan '19 onward

*Department:* Harvard John A. Paulson School of Engineering and Applied Sciences

*Advisor:* Stratos Idreos

*Research:* Self-designing storage engines

### Post-Doctoral Fellow, [Inria, Rennes](#)

Feb '17 – Sep '18

*Team:* Myriads

*Advisor:* Christine Morin

*Research:* Performance of stream-processing engines

### Tata Consultancy Services (TCS) Research Scholar, [IIT Kharagpur](#)

Dec '14 – Jan '17

*Advisor:* Sudip Misra

*Research:* Design and development of sensor-cloud infrastructure

### Junior Research Fellow (JRF), [IIT Kharagpur](#)

Apr '13 – Dec '14

*Advisor:* Sudip Misra

*Research:* Target-tracking in sensor networks

### Programmer Analyst & Trainee, [Cognizant Technology Solutions](#)

Jun '12 – Apr '13

*Project:* Rentokil Initials

*Role:* Designer, Backend developer, Tester

## EDUCATION

### Doctor of Philosophy (Ph.D.)

2013 – 2017

Indian Institute of Technology, Kharagpur, India

*Department:* Department of Computer Science and Engineering

*Dissertation:* Sensors-As-A-Service: Towards the Conceptualization of Sensor-Cloud

### Bachelor of Technology (B.Tech.)

2008 – 2012

Institute of Engineering & Management

*Stream:* Computer Science & Engineering

*Dissertation:* OneWorld Vigilant Online Surveillance System *Score:* 8.99/10

## ACCOLADES

### Fellowship/Scholarship

1. Facebook Grace Hopper Scholarship (*one of the 50 recipients worldwide*), 2016.
2. N2 Women Young Researcher Fellowship through ACM SIGMOBILE, 2016.
3. Student Scholarship to attend the Grace Hopper Celebration of Women in Computing India (GHCI), 2015.
4. Google Anita Borg Fellowship, Asia Pacific, 2015.

5. Tata Consultancy Service (TCS) Research Fellowship, 2014-2017.
6. Research Fellowship from ISIRD, IIT Kharagpur, 2013-2014.

## Awards

1. Mentoring Co-Chair of the N2Women Board, 2020.
2. Marie-Sklodowska-Curie Actions Seal of Excellence for submitting proposal for Marie-Sklodowska-Curie Individual Fellowship, 2018.
3. Awards Co-Chair of the N2Women Board, 2017.
4. One of the 10 Women in Networking/Communications That You Should Watch by N2Women, 2016.
5. Most Qualified Young Scientist to attend the Heidelberg Laureate Forum, 2016.
6. Leader of the Google Anita Borg Scholarship Community (*solitary from the country and one of the seven across the world*) and invited to attend Google I/O 2016.
7. Winner in Hackathon in Robotics at Google Shanghai, 2015.
8. Top 9 projects in ComSoc Student Competition "Communications Technology Changing the World", 2014.
9. Second Runners Up in Samsung Innovation Award, 2014.
10. Second Runners Up in a model making competition from West Bengal Renewable Energy Development Agency (WBREDA), 2009.

## PUBLICATIONS

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### Books

1. S. Misra, S. Sarkar, and **S. Chatterjee**, "Sensors, Cloud, and Fog: The Enabling Technologies for the Internet of Things," *CRC Press, Taylor & Francis Group*, 2019.

### Conferences

1. A. Wasay, **S. Chatterjee**, and S. Idreos, "Deep Learning: Systems and Responsibility," *Proceedings of the ACM SIGMOD International Conference on Management of Data*, 2021.
2. S. Luo, **S. Chatterjee**, R. Ketsetdis, N. Dayan, W. Qin, and S. Idreos, "Rosetta: A Robust Space-Time Optimized Range Filter for Key-Value Stores," *Proceedings of the ACM SIGMOD International Conference on Management of Data*, 2020.
3. **S. Chatterjee**, and C. Morin, "Experimental Study on the Performance and Resource Utilization of Data Streaming Frameworks," *IEEE/ACM Symposium on Cluster, Cloud and Grid Computing (CCGrid)*, 2018.
4. **S. Chatterjee**, and S. Misra, "Adaptive Data Caching for Provisioning Sensors-As-A-Service," *IEEE International Black Sea Conference on Communications and Networking (BlackSeaCom)*, 2016.
5. **S. Chatterjee**, and S. Misra, "QoS Estimation and Selection of CSP in Oligopoly Environment for Internet of Things," *IEEE Wireless Communications and Networking Conference (WCNC)*, 2016.
6. **S. Chatterjee**, and S. Misra, "Optimal Composition of a Virtual Sensor for Efficient Virtualization Within Sensor-cloud," *IEEE International Conference on Communications (ICC)*, 2015.
7. **S. Chatterjee**, S. Sarkar, and S. Misra, "Quantification of Node Misbehavior in Wireless Sensor Networks: A Social Choice-Based Approach," *IEEE International Conference on Communications (ICC) Workshop*, 2015.
8. **S. Chatterjee**, S. Sarkar, and S. Misra, "Energy-Efficient Data Transmission in Sensor-Cloud," *International Conference on Applications and Innovations in Mobile Computing (AIMoC)*, 2015.
9. P. V. S. R. Teja, **S. Chatterjee**, S. N. Das, and S. Misra, "Two-Level Mapping to Mitigate Congestion in Machine to Machine (M2M) Cloud," *International Conference on Applications and Innovations in Mobile Computing (AIMoC)*, 2015.
10. **S. Chatterjee**, and S. Misra, "Dynamic and Adaptive Data Caching Mechanism for Virtualization within Sensor-Cloud," *IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS)*, 2014.

## Journals

1. S. Idreos, K. Zoumpatianos, **S. Chatterjee**, W. Qin, A. Wasay, B. Hentschel, M. Kester, N. Dayan, D. Guo, M. Kang, and Y. Sun, "Learning Data Structure Alchemy," *Bulletin of the IEEE Computer Society Technical Committee on Data Engineering*, 2019.
2. **S. Chatterjee**, A. Roy, S. K. Roy, S. Misra, M. S. Bhogal, and R. Daga, "Big-Sensor-Cloud Infrastructure: A Holistic Prototype for Provisioning Sensors-as-a-Service," *IEEE Transactions on Cloud Computing*, 2019.
3. S. Sarkar, **S. Chatterjee**, and S. Misra, R. Kudupudi, "Privacy-Aware Blind Cloud Framework for Advanced Healthcare," *IEEE Communication Letters*, 2017.
4. P. Bhavathankar, **S. Chatterjee**, and S. Misra, "Link-Quality Aware Path Selection in the Presence of Proactive Jamming in Fallible Wireless Sensor Networks," *IEEE Transactions on Communications*, 2017.
5. S. Sarkar, **S. Chatterjee**, and S. Misra, "Assessment of the Suitability of Fog Computing in the Context of Internet of Things," *IEEE Transactions on Cloud Computing*, 2015.
6. **S. Chatterjee**, S. Misra, and S. U. Khan, "Optimal Data Center Scheduling for Quality of Service Management in Sensor-cloud," *IEEE Transactions on Cloud Computing*, 2015.
7. **S. Chatterjee**, R. Ladia, and S. Misra, "A Dynamic Optimal Pricing Scheme for Heterogeneous Service-Oriented Architecture for Sensor-cloud Infrastructure," *IEEE Transactions on Services Computing*, 2015.
8. S. Misra, A. Singh, **S. Chatterjee**, and A. K. Mandal, "QoS-Aware Sensor Allocation for Target Tracking in Sensor-Cloud," *Ad Hoc Networks*, Elsevier, 2015.
9. S. Sarkar, **S. Chatterjee**, and S. Misra, "Evacuation and Emergency Management Using a Federated Cloud," *IEEE Cloud Computing Magazine*, 2015.
10. S. Misra, and **S. Chatterjee**, "Social Choice Considerations in Cloud-Assisted WBAN Architecture for Post-Disaster Healthcare: Data Aggregation and Channelization," *Information Sciences*, Elsevier, 2014.
11. **S. Chatterjee**, and S. Misra, "Sensor-Target Mapping in Presence of Overlapping Coverage: Tracking Using Sensor-Cloud," *IEEE Communication Letters*, 2014.
12. S. Misra, A. Singh, **S. Chatterjee**, and M. S. Obaidat, "Mils-Cloud: A Sensor-Cloud Based Architecture for the Integration of Military Tri-Services Operations and Decision Making," *IEEE Systems Journal*, 2014.
13. S. Misra, **S. Chatterjee**, and M. S. Obaidat, "On Theoretical Modeling of Sensor-Cloud: A Paradigm Shift From Wireless Sensor Network," *IEEE Systems Journal*, 2014.

## Patents

1. **S. Chatterjee**, A. Roy, S. K. Roy, S. Misra, M. S. Bhogal, and R. Daga, "Sensory network for persuasive and pervasive virtualization of physical sensors into renderable time service", Indian patent filed in November 2014 (Ref: 1145/KOL/2014).
2. S. Sarkar, **S. Chatterjee**, S. Misra, E. A. Ansari, D. Ghatak, and S. Sarkar, "A Privacy-Aware ambulatory healthcare system using wireless body area networks (WBANS).", Indian patent filed in January 2016 (Ref: 201631000214).

## Theses

1. **S. Chatterjee**, "Sensors-As-A-Service: Towards the Conceptualization of Sensor-Cloud", *Ph.D. Thesis*, July, 2017.

## INVITED TALKS

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1. "Cosine: A Cloud-Cost Optimized NoSQL Storage Engine", **Cornell University**, USA, 2021
2. "Cosine: A Cloud-Cost Optimized NoSQL Storage Engine", **North East DB Day, Massachusetts Institute of Technology**, USA, 2020
3. "Cosine: A Cloud-Cost Optimized NoSQL Storage Engine", **Boston University**, USA, 2020

4. "Design and development of cloud-based autonomous stream processing platforms for big data streams", **Inria** Rennes, France, 2017
5. "Design and development of cloud-based autonomous stream processing platforms for big data streams", **Université Pierre-et-Marie-Curie**, Paris, France, 2017
6. "Sensors-As-A-Service: Towards the Conceptualization of Sensor-Cloud", **Polytechnic University of Catalonia**, Catalonia, 2017
7. "Sensors-As-A-Service: Towards the Conceptualization of Sensor-Cloud", **Berkeley National Laboratory**, USA, 2017

## TEACHING EXPERIENCE

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### Harvard University

- Teaching Fellow for CS265: Big Data Systems (*Spring 2019, 2020*)
- Teaching Fellow for CS165: Data Systems (*Fall 2021, Fall 2019*)

### Indian Institute of Technology Kharagpur

- Laboratory Assistantship for IT60119: Wireless Adhoc Sensor Networks (*Fall 2015*)
- Teaching Assistantship for IT60102: Internet and Web Technologies (*Spring 2015*)
- Laboratory Assistantship for IT60192: Internet and Web Technologies (*Spring 2015*)
- Teaching Assistantship for IT60119: Wireless Adhoc Sensor Networks (*Fall 2014*)

## SERVICES TO COMMUNITY

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Mentoring Co-Chair of the <b>N2Women Board</b>	2021 <i>onward</i>
ACM SIGMOD <b>Reproducibility Committee</b>	2020
Core Member of <b>Embedded EthiCS</b> , Harvard University	2019 <i>onward</i>
Awards Co-Chair of the <b>N2Women Board</b>	2016 – 2018

### Reviewer in International Journals

- IEEE Transactions on Vehicular Technology, IEEE Transactions on Cloud Computing, IEEE Transactions on Big Data, IEEE Transactions on Communications, IEEE Transactions on Parallel and Distributed Systems, Pervasive and Mobile Computing, Elsevier, IEEE Systems Journal, IEEE Internet of Things, International Journal of Communication Networks and Distributed Systems (IJCNDS)

### Program Committee Member

- ICDE (2022), ACM SIGMOD (2021), The WebConf (2020), FICN (2018), IEEE SmartData (2019), IEEE BigData (2018, 2019), IEEE TechSym (2014, 2016)

### Reviewer in International Conferences

- PVLDB (2022), ICDE (2022), ACM SIGMOD (2021), The WebConf (2020), ACM MobiCom Future Industrial Communication Networks (FICN) 2018, IEEE SmartData (2019), IEEE BigData (2018, 2019), IEEE ICPEC (2017), IEEE ICC (2015, 2016), IEEE TechSym (2014, 2016), IEEE ANTS (2015)

## TECHNICAL SKILLS

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**Selected Languages:** C, C++, Java, Python, Database coding (NoSQL, SQL)

**Selected Platforms:** RocksDB, WiredTiger, FASTER, Apache Flink, Apache Storm, Twitter Heron, Apache Spark

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