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.

EDUCATION

Doctor of Philosophy (Ph.D)   2013 – 2017
Indian Institute of Technology, Kharagpur, India
Broad areas of research: cloud computing, wireless sensor networks
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
Score: 8.99/10

Higher Secondary Examination   2006 – 2008
Patha Bhavan, Kolkata, India
Subjects: Physics, Chemistry, Mathematics, Biology
Score: 90%

Secondary Examination   2006
Julien Day School, Elgin Road, Kolkata, India
Subjects: Science
Score: 91.5%

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

TEACHING EXPERIENCE

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*)

PUBLICATIONS

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.

ACCOLADES

Fellowship/Scholarship

1. Awarded the **Facebook Grace Hopper Scholarship** (*one of the 50 recipients worldwide*), 2016

2. Awarded the **N2 Women Young Researcher Fellowship** through **ACM SIGMOBILE** program to attend IEEE WCNC, 2016

3. Awarded the **Student Scholarship** to attend the **Grace Hopper Celebration of Women in Computing India (GHCI)**, 2015 conference.

4. Awarded **Google Anita Borg Fellowship, Asia Pacific**, (2015).

5. Awarded **Tata Consultancy Service (TCS) Research Fellowship** (2014-2017).

6. Awarded **Fellowship** from **ISIRD, IIT Kharagpur** (2013-2014).

Awards/Certifications

1. Selected as the **Mentoring Co-Chair** of the **N2Women Board**, 2020.

2. Awarded the **Marie-Sklodowska-Curie Actions Seal of Excellence** for submitting proposal for Marie-Sklodowska-Curie Individual Fellowship, 2018.

3. Selected as the **Awards Co-Chair** of the **N2Women Board**, 2017.

4. Selected as one of the **10 Women in Networking/Communications That You Should Watch** by **N2Women**, 2016.

5. Selected as one of the **Most Qualified Young Scientist** to attend the **Heidelberg Laureate Forum**, 2016.

6. Selected as the **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. Awarded as the **Winner** in **Hackathon in Robotics** at **Google Shanghai**, 2015.

8. Awarded certificate of appreciation at **ComSoc Student Competition** "Communications Technology Changing the World", for being ranked among the **top 9** projects, 2014.

9. Awarded **Second Runners Up** in **Samsung Innovation Award**, 2014.

10. Awarded **certificate of Merit** and **certificate of participation** from **West Bengal Renewable Energy Development Agency (WBREDA)** in association with **Vivekananda Institute of Environment and Management**, Kolkata for being **Second Runners Up** in a model making competition, 2009.

RESEARCH VISITS/TALKS

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

SERVICES TO COMMUNITY

Mentoring Co-Chair of the **N2Women Board**	2021 *onward*
ACM SIGMOD **Reproducibility Committee**	2020
Core Member of **Embedded EthiCS**, Harvard University	2019 *onward*
Awards Co-Chair of the **N2Women Board**	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/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 ICFEC (*2017*), IEEE ICC (*2015, 2016*), IEEE TechSym (*2014, 2016*), IEEE ANTS (*2015*)

TECHNICAL SKILLS

Selected Languages: C, C++, Java, Python, Database coding (NoSQL, SQL, T-SQL)
Selected Platforms: RocksDB, WiredTiger, FASTER, Apache Flink, Apache Storm, Twitter Heron, Apache Spark