SUBHRENDU CHATTOPADHYAY

A Contact Information

- **Present Address:**
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  c/o Subhas Ch. Chattopadhyay,
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- **GitHub:** `https://github.com/subhrendu1987`

B Research Objective

At present I am an Assistant Professor in the Department of Computer Science and Engineering, Thapar Institute of Engineering and Technology (TIET).

My reserch interests are in computer systems (e.g. Computer Networks, Operating Systems, Distributed Systems). During my PhD my primary research focus was in Software Defined Networking (SDN), Network Function Virtualization (NFV), Fog Computing, Next Generation Networks, and Performance Modeling of Network and Communication Systems. My contributions were to enhance the scalability of SDN in large-scale IoT environments, where I successfully developed and implemented orchestration frameworks that automate deployment and provide robust fault and partition tolerance. I am passionate about creating self-managing, future-proof network architectures.

At IDRBT, I was instrumental in the 5G Use-Case Lab for BFSI, contributing to the identification and development of critical India-specific 5G applications for the financial sector. I also played a key role in the establishment of the Network Innovation Lab (NIL), a dedicated facility for advancing network design, development, and management to foster evolutionary network architectures and test financial applications.

In my current assignment I have continued to am actively working on In both capacities, I engaged in in-depth research at the intersection of network, operating systems and distributed systems.

I like to diagnose system problems, simplifying them to their essence, and conceptualizing elegant solutions. This analytical approach clarifies issues and often reveals interdisciplinary connections, allowing me to leverage diverse insights for innovative problem-solving.

C Academic Qualification

- **PhD:** Doctor of Philosophy in Computer Science and Engineering from Indian Institute of Technology, Guwahati (July,2014 - April,2021)
- **Post Graduation:** Master of Technology in Computer Science and Engineering with **CGPA: 8.81/10** from Indian Institute of Technology, Guwahati (June,2012 - July,2014)
- **Graduation:**Bachelor of Technology in Computer Science and Engineering with **CGPA: 8.04/10** from B.P Poddar Institute of Management and Technology, WestBengal University of Technology (July,2006 - June,2010)
- **Higher Secondary (10+2):** with **77.5%** from Beldanga C.R.G.S High School, under West Bengal Council of Higher Secondary Examination (May,2006)
- **Secondary (10):** Madhyamik with **81.5%** from Sargachhi Ramakarishna Mission High School, under West Bengal Board of Secondary Education (April,2003)

D Professional Experience

- **Assistant Professor:** Thapar Institute of Engineering and Technology (TIET), Patiala(January,2025 - Till Date)

- **Assistant Professor:** Institute for Development and Research in Banking Technology (IDRBT), Hyderabad(April,2022 - December,2024)
- **Assistant Professor:** Department of CSE in SRM-University, AP(June 2021 - April 2022)
- **Temporary Project Staff:** Department of Computer Science and Engineering in Indian Institute of Technology, Kharagpur (October,2020 - March,2021)
  Project Name: Development of Algorithms and Tools for Log Analytics and Vulnerability Assessment
  Principal Investigator: Dr. Sandip Chakraborty
- **Automation Test Engineer:** Programmer Analyst Trainee in Cognizant Technology Solution India Pvt. Ltd. (July,2010 - July,2011)

E Thesis

Subhrendu Chattopadhyay,*SDN for Large Scale IoT Networks*, PhD thesis, Supervised by Prof. Sukumar Nandi, Indian Institute of Technology Guwahati, `http://gyan.iitg.ernet.in/handle/123456789/1854`, 2021.

F Awards

1. **Fellowship:** Recipient of TCS Research scholarship (Cycle 10) and Fellowship from MHRD
2. **Travel Grants:**
   (a) Received conference travel grant from IEEE COMSNETS and LRN foundation.
   (b) Recipient of travel grant from Microsoft India, Research and Development
3. **Best paper awards:**
   (a) IEEE INFOCOM 2019 [**?**] (in a session)
   (b) IEEE COMSNETS 2016 [**?**]
   (c) IEEE ANTS 2013 [**?**]

G Subjects Taught

1. **Objected Oriented Programming with C++ (UG: Th+Lab)** in TIET
2. **Microprocessor Based System Design (UG: Th+Lab)** in TIET
3. **Advanced Operating Systems (PG: Th+Lab)** in IDRBT, UoH Campus
4. **Internet Technology (PGDBT: Th+Lab)** in IDRBT
5. **Computer Networking (UG: Th+Lab)** in SRM-University, AP
6. **Objected Oriented Programming with C++ (UG: Th+Lab)** in SRM-University, AP
7. **Operating Systems (UG: Th+Lab)** in SRM-University, AP

H Projects

1. **5G Usecase Lab for BFSi:** Funded by DoT and DFS (GoI), PI: Prof. V.N. Sastry, Co-PI: Subhrendu Chattopadhyay, Abhishek Thakur, INR. 1.05 Cr.
2. **Consultancy on Comprehensive IT Infrastructure Review:** A Public sector Bank, Co-PI: Subhrendu Chattopadhyay, Radha V, N.P. Dhavale, Dipanjan Roy, INR. 28,500,00
3. **Consultancy on SIEM Solutions:** A Private sector Bank, Co-PI: Subhrendu Chattopadhyay, Dipanjan Roy, INR. 3,00,000

I Voluntary Services

1. Conference Reviewer: IEEE ANTS (2014 - 2024), IEEE ICC 2017, IEEE NCC 2017, IEEE ISED 2017, IEEE COMSNETS (2018-2024), COMSYS 2023
2. Journal Reviewer: Springer Journal of Network and Systems Management
3. Member of Technical Program Committee: IEEE COMSNETS (2020-2024), CSI 2022, NCC 2021, 2022, ICDCN 2023

J Collaborations

I had the opportunity to collaborate with the following distinguished researchers.

1. Dr. Sandip Chakraborty, Associate Professor, IIT Kharagpur [On-going]
2. Prof. Soumya K Ghosh, Professor, IIT Kharagpur
3. Prof. Sushanta Karmakar, Professor, IIT Guwahati
4. Dr. Samar Shailendra, Adjunct Faculty, IIIT Bangalore
5. Dr. Abhinandan S. Prasad, Assistant Professor, IIT Ropar [On-going]
6. Dr. Niladri Sett, Assistant Professor, SRM University AP
7. Dr. Soumyajit Chatterjee, Research Scientist, Nokia Bell Labs Cambridge
8. Dr. Shubhabrata Nath, Assistant Professor, IIIT Guwahati

K Reference Persons

1. Prof. Sukumar Nandi, Senior Professor
   Department of CSE, IIT Guwahati, Assam, India-781039, sukumar@iitg.ac.in, (+91 361 258 2357)
2. Dr. Sandip Chakraborty, Associate Professor
   Department of CSE, IIT Kharagpur, West Bengal, India-721302, sandipc@cse.iitkgp.ac.in, (+91 322 228 2898)
3. Prof. V. N. Sastry, Professor
   IDRBT, Masab Tank, Hyderabad, Telengana, India-500057, vnsastry@idrbt.ac.in, (+91 40 2329 4304)
4. Prof. Soumya Kanti Ghosh, Professor
   Department of CSE, IIT Kharagpur, West Bengal, India-721302, skg@cse.iitkgp.ac.in, (+91 322 228 2332)

List of Publications

[1] Bratin Mondal, Utkalika Satapathy, Sandip Chakraborty, and Subhrendu Chattopadhyay. GranuloTrack: Kernel-deep telemetry with event-driven precision for system observability. In *Under Review*, -. Under Review.

[2] Utkalika Satapathy, Harsh Borse, Rajat Bachhawat, Neha Dalmia, Subhrendu Chattopadhyay, and Sandip Chakraborty. XPLOG: A dynamic observability framework for distributed sandboxed microservices. *Under Review*, -. Under Review.

[3] Neha Chowdhary, Utkalika Satapathy, Theophilus Benson, Subhrendu Chattopadhyay, Sayandeep Sen, Palani Kodeswaran, and Sandip Chakraborty. BeeGuard: Explainability-based Policy Enforcement of `eBPF` Codes for Cloud-native Environments. In *Seventeenth International Conference on COMmunication Systems NETworkS (COMSNETS)*, volume 17, Bangalore, IN, 6 - 10 January 2025.

[4] Tanmoy Dutta, Neha Chowdhary, Subhrendu Chattopadhyay, and Sandip Chakraborty. AutoPAC: Exploring LLMs for Automating Policy to Code Conversion in Business Organizations. In *Seventeenth International Conference on COMmunication Systems NETworkS (COMSNETS)*, volume 17, Bangalore, IN, 6 - 10 January 2025.

[5] Arpit Tripathi, Abhishek Thakur, Abhinandan Sridhara Rao Prasad, Bheemarjuna Reddy Tamma, and Subhrendu Chattopadhyay. MADE: An MEC Supported Platform Independent and Version Agnostic Framework for Mobile Application Deployment. In *Sixteenth IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS)*, volume 16, Guwahati, IN, 4-6 December 2024.

[6] Utkalika Satapathy, Rishabh Thakur, Subhrendu Chattopadhyay, and Sandip Chakraborty. Disprotrack: Distributed provenance tracking over serverless applications. In *Forty First IEEE International Conference on Computer Communications (INFOCOM)*, volume 41, NewYork, US, 4-6 May 2023.

[7] Shubha Brata Nath, Subhrendu Chattopadhyay, Raja Karmakar, Sourav Kanti Addya, Sandip Chakraborty, and Soumya K. Ghosh. Containerized deployment of micro-services in fog devices: A reinforcement learning-based approach. *The Journal of Supercomputing (JSUP), Springer*, 78(5):6817–6845, 2022.

[8] Subhrendu Chattopadhyay, Soumyajit Chatterjee, Sukumar Nandi, and Sandip Chakraborty. Aloe: Fault-tolerant network management and orchestration framework for IoT applications. *IEEE Transactions on Network and Service Management*, 17(4):2396–2409, 2020.

[9] Subhrendu Chattopadhyay, Sukumar Nandi, Sandip Chakraborty, and Abhinandan Prasad. Amalgam: Distributed network control with scalable service chaining. In *Nineteenth IFIP Networking Conference (IFIP Networking)*, volume 19, pages 519–523, Paris, FR, 22-25 June 2020.

[10] Subhrendu Chattopadhyay, Soumyajit Chatterjee, Sukumar Nandi, and Sandip Chakraborty. Aloe: An elastic auto-scaled and self-stabilized orchestration framework for IoT applications. In *Thirty Eighth IEEE International Conference on Computer Communications (INFOCOM)*, volume 38, Paris, FR, 29 April - 2 May 2019.

[11] Shubha Brata Nath, Subhrendu Chattopadhyay, Raja Karmakar, Sourav Kanti Addya, Sandip Chakraborty, and Soumya K. Ghosh. PTC: Pick-test-choose to place containerized micro-services in IoT. In *2019 IEEE Global Communications Conference (GLOBECOM)*, pages 1–6, Waikoloa, US, 9-13 December 2019.

[12] Subhrendu Chattopadhyay, Samar Shailendra, Sukumar Nandi, and Sandip Chakraborty. Improving MPTCP performance by enabling sub-flow selection over a SDN supported network. In *Fourteenth International Conference on Wireless and Mobile Computing, Networking and Communications (WiMob)*, volume 14, Limmasol, CY, 15-17 October 2018.

[13] Subhrendu Chattopadhyay, Sukumar Nandi, Samar Shailendra, and Sandip Chakraborty. Poster: Primary path effect in multi-path TCP: How serious is it for deployment consideration?, 10-14 July 2017.

[14] Subhrendu Chattopadhyay, Niladri Sett, Sukumar Nandi, and Sandip Chakraborty. Flipper: Fault-tolerant distributed network management and control. In *Fifteenth IFIP/IEEE International Symposium on Integrated Network Management (IM)*, volume 15, Lisbon, PT, 8-12 May 2017.

[15] Pranav Kumar Singh, Subhrendu Chattopadhyay, Pradeepkumar Gajendra Bhale, and Sukumar Nandi. Fast and secure handoffs for v2i communication in smart city wi-fi deployement. In *Fourteenth International Conference on Distributed Computing and Internet Technology (ICDCIT)*, volume 14, Bhubaneswar, IN, 13-16 January 2017.

[16] Sandip Chakraborty and Subhrendu Chattopadhyay. ES2: Managing link level parameters for elevating data rate and stability in high throughput wlan. In *Eighth International Conference on COMmunication System & NETworks (COMSNET 2016)*, volume 8, Bangalore, IN, 5-9 January 2016.

[17] Sandip Chakraborty, Sukumar Nandi, and Subhrendu Chattopadhyay. Alleviating hidden and exposed nodes in high-throughput wireless mesh networks. *IEEE Transactions on Wireless communications*, 15(2):928–937, 2016.

[18] Subhrendu Chattopadhyay, Sandip Chakraborty, and Sukumar Nandi. Leveraging the trade-off between spatial reuse and channel contention in wireless mesh networks. In *Eighth International Conference on COMmunication System & NETworks (COMSNET 2016)*, volume 8, Bangalore, IN, 5-9 January 2016.

[19] Niladri Sett, Subhrendu Chattopadhyay, Sanasam Ranbir Singh, and Sukumar Nandi. A time aware method for predicting dull nodes and links in evolving networks for data cleaning. In *Fourteenth IEEE/WIC/ACM International Conference on Web Intelligence (WI)*, volume 14, pages 304–310, Omaha, US, 13-16 October 2016.

[20] Sushanta Karmakar and Subhrendu Chattopadhyay. A trigger counting mechanism for ring topology. In *Thirty Seventh Australasian Computer Science Conference-Volume (ACSC 2014)*, volume 37, pages 81–87, Auckland, NZ, jan 2014.

[21] Sandip Chakraborty, Subhrendu Chattopadhyay, Suchetana Chakraborty, and Sukumar Nandi. Defending concealedness in IEEE 802.11n. In *Sixth IEEE International Conference on COMmunication System & NETworks (COMSNET 2014)*, volume 6, pages 1–8, Bangalore, IN, 7-10 January 2014.

[22] Sandip Chakraborty, Sukumar Nandi, and Subhrendu Chattopadhyay. Surpassing flow fairness in a mesh network: How to ensure equity among end users? In *Seventh IEEE International Conference on Advanced Networks and Telecommunication Systems (ANTS 2013)*, volume 7, Chennai, IN, 15-18 December 2013.