Dr. Sudip Roy, BSc, BTech, MS, PhD; JSPS Fellow (2021-2022)

dblp | Google Scholar | ORCiD | ResearchGate | LinkedIn

CONTACT DETAILS	Associate Professor, Department of Computer Science and Engineering Joint Faculty, Centre of Excellence in Disaster Mitigation and Management Indian Institute of Technology Roorkee (IITR) Roorkee - 247667, Uttarakhand, India Tel#: +91-1332-284815 (O); +91-1332-286815 (R); +91-9410904504 (M) E-mail ID: sudip.roy@cs.iitr.ac.in; sudiproy.bkp@gmail.com Web: http://faculty.iitr.ac.in/∼sudiproy.fcs/; https://www.iitr.ac.in/∼CSE/Sudip_Roy

PERSONAL DETAILS
Date of Birth: August 1, 1979
Nationality: Indian
Language Known: English (R/W/S), Bengali (mother tongue) (R/W/S), Hindi (R/W/S)

RESEARCH INTERESTS
Design Automation for Microfluidic Biochips, Cyber-Physical Systems, Internet-of-Things (IoTs), Application of Machine Learning for Disaster Risk Reduction (DRR)

TEACHING INTERESTS
Design and Analysis of Algorithms, Computational Geometry, Programming and Data Structures, Computer Architecture and Organization, Compiler Design, Electronic Design Automation

ACADEMIC RECORDS

Indian Institute of Technology (IIT) Kharagpur, West Bengal, India
  Doctor of Philosophy (PhD) in Computer Science and Engineering, *July, 2014*

Indian Institute of Technology (IIT) Kharagpur, West Bengal, India
  Master of Science (MS by Research) in Computer Science and Engineering, *May, 2009*

University of Calcutta, Kolkata, West Bengal, India
  Bachelor of Technology (BTech) in Computer Science and Engineering, University College of Science and Technology (Rajabazar Science College), Kolkata, *August, 2004*
  Bachelor of Science (BSc) in Physics (Honors), Rahara Ramkrishna Mission Vivekananda Centenary College (affiliated to University of Calcutta), *July, 2001*

CURRENT AFFILIATIONS

Department of Computer Science and Engineering (CSE), IIT Roorkee, India
  Associate Professor　　　　　　**Aug 2023 to present [1 months running]**
Centre of Excellence in Disaster Mitigation and Management (CoEDMM), IITR, India
  Joint Faculty　　　　　　**Apr 2015 to present [8 years 4 months running]**

PAST WORK EXPERIENCES

Department of Computer Science and Engineering (CSE), IIT Roorkee, India
  Assistant Professor (Regular)　　　　　　**Dec 2014 to present [8 years 8 months]**
Department of Computer Science, College of Information Science and Engineering, Ritsumeikan University, Biwako-Kusatsu Campus, Japan
  JSPS Fellow　　　　　　**Apr 2021 to Jan 2022 [10 months]**
  *-Under the Japan Society for the Promotion of Science (JSPS) Invitational Fellowships for Research in Japan (Long-term); Host researcher: **Professor Shigeru Yamashita**, College of Information Science and Engineering, Ritsumeikan University, Biwako-Kusatsu Campus, Japan*
Disaster Prevention Research Institute (DPRI), **Kyoto University**, Uji, Kyoto, Japan
  Visiting Research Scholar　　　　　　**Feb 2020 to Mar 2021 [1 year 2 months]**
  *-Host researchers: **Professor Hirokazu Tatano** and **Dr. Subhajyoti Samaddar**, Tatano Lab, Social System for Disaster Risk Governance, Disaster Prevention Research Institute, Kyoto University, Uji Campus, Kyoto, Japan.*
Department of Computer Science and Engineering (CSE), IIT Roorkee, India
  Assistant Professor (On Contract)　　　　　　**Jul 2014 to Nov 2014 [4 months]**
National Cheng Kung University (NCKU), Tainan, Taiwan
  Research Associate　　　　　　**Feb 2014 to Jul 2014 [6 months]**
Indian Institute of Technology Kharagpur (IITKGP), Kharagpur, India
  Research Scholar　　　　　　**Oct 2009 to Jan 2014 [4 years and 4 months]**
Indian Statistical Institute Kolkata (ISICAL), Kolkata, India
  Project Linked Personnel　　　　　　**Jul 2008 to Sep 2009 [1 year and 3 months]**
Indian Institute of Technology Kharagpur (IITKGP), Kharagpur, India
  Junior Project Assistant　　　　　　**Aug 2005 to Jun 2008 [2 years and 10 months]**
Indian Statistical Institute Kolkata (ISICAL), Kolkata, India
  Project Linked Personnel　　　　　　**Nov 2004 to Jul 2005 [9 months]**

HONORS AND AWARDS

- JSPS Invitational Fellowship Award (Long-Term) from the Japan Society for the Promotion of Science (JSPS), Govt. of Japan in 2021
- Early-Career Research Award from Department of Science and Technology, Govt. of India in 2017
- Microsoft Research India PhD Fellowship Award in 2010
- National scholarship by Ministry of Human Resource Development, Govt. of India in 2001
- Invited Talk in **NII Shonan Seminar** entitled "Microfluidic Biochips: Bridging Biochemistry with Computer Science and Engineering" during Feb 26 - Mar 2, 2017 in Japan
- Invited Talk in **Dagstuhl Seminar:15352** on "Design Automation for Digital Microfluidic Biochips", in Dagstuhl during Aug 23-26, 2015 in Saarbruken, Germany

RESEARCH PROJECTS AND GRANTS ACQUIRED AT IIT ROORKEE, INDIA

Total amount of research grants received as **PI**: ∼6158K INR ≈ 82.7K US$
Total amount of research grants received as **Co-PI**: ∼5255K INR ≈ 70.48K US$
Total amount of financial assistance received as **PI** and **Co-PI**: ∼120,900K INR ≈ 1627K US$

1. Research project (**as Co-PI**) titled as "Optimal Route Alignment in Sikim Area" under the scheme of Centre for Acquisition for Research Services (CARS) sponsored by Defence Research and Development Organisation (DRDO), Ministry of Defence, Government of India in collaboration with Prof. Pitambar Pati (PI), Department of Earth Sciences, IIT Roorkee and Prof. R. N. G. Ransinchung (Co-PI), Department of Civil Engineering, IIT Roorkee. Total Grant: ∼**4700K INR ≈ 63K US**$ (Jun 2021 - Dec 2023)

2. Research project (**as Co-PI**) titled as "A Software-Programmable Microfluidic Device for Automated 3D Cancer Drug Screening" sponsored by 2020 SATU Joint Research Scheme (JRS) for international collaboration with Prof. Ting-Yuan Tu of National Cheng Kung University, Taiwan, Prof. Thamil Selvee Ramasamy of University of Malaya, Malaysia and Prof. Sukanta Bhattacharjee of Indian Institute of Technology Guwahati, India. Total Grant: ∼**355K INR ≈ 4.78K US**$ (May - Dec, 2020)

3. Research project (**as Co-PI**) titled as "Computer-Aided Design for Implementation of Biochemical Protocols Using Cyber-Physical Microfluidic Lab-On-a-Chips" sponsored by 2020 SATU Joint Research Scheme (JRS) for international collaboration with Prof. Sying-Jyan Wang, National Chung Hsing University, Taiwan. Total Grant: ∼**200K INR ≈ 2.7K US**$ (May - Dec, 2020)

4. Research project (**as PI**) titled as "Design automation for state-of-the-art microfluidic lab-on-a-chips (DALoC)" under the scheme of Project-based Personnel Exchange Programme (PPP) sponsored by Department of Science and Technology (DST), Ministry of Science and Technology. Government of India and German Academic Exchange Service (DAAD) for collaboration with Dr.-Ing. Bing Li, Technical University of Munich (TUM), Germany. Total Grant: ∼**1200K INR ≈ 16K US**$ (Sep 2018 - Sep 2020)

5. Research project (**as PI**) titled as "Design Methodology for Programmable Microfluidic Devices by Integrating Architectural and Logic Synthesis Techniques" under the scheme of India-Japan Cooperative Science Programme (IJCSP) sponsored by Department of Science and Technology (DST), Ministry of Science and Technology. Government of India and the Japan Society for the Promotion of Science (JSPS), Japan for collaboration with Prof. Shigeru Yamashita, Ritsumeikan University, Japan. Total Grant: ∼**758K INR ≈ 10.2K US**$ (Sep 2017 - Sep 2019)

6. Research project (**as PI**) titled as "Automated Sample Preparation, Real-life Bioprotocol Implementation and Synthetic Biology using Microfluidic Lab-on-a-Chips (LoCs)" under the scheme of Early Career Research Award (ECRA) sponsored by Science and Engineering Research Board (SERB), Department of Science and Technology (DST), Ministry of Science and Technology. Government of India. Total Grant: ∼**3200K INR ≈ 43K US**$ (Jul 2017 - Jul 2020)

7. Research project (**as PI**) titled as "FPGA-Prototyping of Microcontrollers for Microfluidic Biochips by Computer-Aided-Design (CAD) and High-Performance Computing (HPC) Tools and Techniques" under the scheme of Faculty Initiation Grant (FIG) sponsored by SRIC, IIT Roorkee, India. Total Grant: ∼**1000K INR ≈ 13.5K US**$ (Oct 2015 - Dec 2017)

8. Financial assistance (**as Co-PI**) titled as "Wide bandwidth Transreceiver Test System" for conducting interdisciplinary research jointly among Dept. of Physics, Dept. of Electronics and Communication Engineering (ECE) and Dept. of CSE under the scheme of Support for Major Interdisciplinary Laboratory Equipment (SMILE) sponsored by SRIC, IIT Roorkee, India. Total Grant: ∼**20900K INR ≈ 281K US**$ (one time grant in Aug 2017)

9. Financial assistance (**as Co-PI**) for "Electronics and Information Communication Technology (EICT) Academy in IIT Roorkee" under the Scheme of Financial Assistance for setting up of Electronics and ICT Academies sponsored by Ministry of Electronics and Information Technology

US AND INDIAN PATENTS GRANTED

[P3] "An Efficient Mixture Preparation Method Using Digital Microfluidic Biochips", Srijan Kumar, Partha Pratim Chakrabarti, **Sudip Roy** and Bhargab Bikram Bhattacharya, Indian Patent # 438166, granted on July 11, 2023 (Patent application # 600/KOL/2013 dated 24th May, 2013).

[P2] "Architectural Layout for Dilution with Reduced Wastage in Digital Microfluidic Based Lab-On-a-Chip", Bhargab B. Bhattacharya, **Sudip Roy** and Krishnendu Chakrabarty, United States Patent # 9,201,042, granted on December 1, 2015. Weblink.

[P1] "High Throughput and Volumetric Error Resilient Dilution with Digital Microfluidic Based Lab-On-a-Chip", Bhargab B. Bhattacharya, Sarmishtha Ghoshal, **Sudip Roy** and Krishnendu Chakrabarty, United States Patent # 9,128,014, granted on September 8, 2015. Weblink.

US AND INDIAN PATENTS FILED

[P2] "Dilution Method for Digital Microfluidic Biochips", Bhargab B. Bhattacharya, **Sudip Roy** and Krishnendu Chakrabarty, US Patent Application number: US 13/809,357, Filing date: 13 November, 2010, Publication number: US20130115703 A1, Publication date: May 9, 2013. Weblink.

[P1] "Routing-Aware Resource Allocation for Biochemical Mixture Preparation Using Digital Microfluidic Biochips", **Sudip Roy**, Partha Pratim Chakrabarti, Srijan Kumar and Bhargab Bikram Bhattacharya, Patent application # 601/KOL/2013 dated 24th May, 2013.

BOOK AND BOOK CHAPTER

[B3] **Sudip Roy**, Brajesh Kumar Kaushik and Sudeb Dasgupta, "Selected Articles from VDAT 2017 Conference", ASP Journal of Low Power Electronics (JOLPE), vol. 14(2), pp. 255–256, February, 2018. Weblink.

[B2] **Sudip Roy** and Ajit Pal, "Impact of Leakage Power Reduction Techniques on Parametric Yield: Low-Power Design of Digital Integrated Circuits under Process Parameter Variations", ISBN:978-3-659-27391-9, 172 pages, LAP Lambert Academic Publishing, January, 2013. Weblink.

[B1] Sarmishtha Ghoshal, Debasis Mitra, **Sudip Roy** and Dwijesh Dutta Majumder, "Chapter 9: Advance in Biosensors and Biochips", Modern Sensors, Transducers and Sensor Networks (Book Series: Advances in Sensors: Reviews, Vol. 1), Sergey Y. Yurish(ed.), ISBN:978-84-615-9012-4, pp. 9:1-9:33, International Frequency Sensor Association (IFSA) Publishing, May, 2012. Weblink.

PUBLICATIONS IN INTERNATIONAL PEER-REVIEWED JOURNALS

[*In this list, please note the following: (a) FIVE best publications in last FIVE years are marked with ✿. (b) FIVE most important publications are marked with ★. (c) Best FIVE are* highlighted. *(d) Q1: 10, Q2: 10, Q3: 5, Q4: 2*]

[J31] Debraj Kundu and **Sudip Roy**, "Multi-Target Fluid Mixing in MEDA Biochips: Theory and an Attempt towards Waste Minimization", accepted for publication in the ACM Transactions on Design Automation of Electronic Systems (ACM TODAES), August, 2023. [IF = 1.232; SJR: Q2]

[J30] ✿ Debraj Kundu, S. V. Lavanya, Sukanta Bhattacharjee, Shigeru Yamashita and **Sudip Roy**, "Preparing Fluid Samples under Retention Time Constraints using Flow-based Microfluidic Biochips", accepted for publication in the IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (IEEE TCAD), 10 pages, December, 2022. DOI: 10.1109/TCAD.2023.3237980 [IF = 2.168; SJR: Q1]

[J29] Sumit Sharma and **Sudip Roy**, "Optimizing Bend-Loss in Optical Waveguide Channel Routing on Photonic Integrated Circuits", Springer Journal of Computational Electronics (JCE), vol. 22, pp. 350 - 363, December, 2022. DOI: 10.1007/s10825-022-01989-4 [IF = 1.983; SJR: Q3]

[J28] Chiharu Shiro, Hiroki Nishikawa, Xiangbo Kong, Hiroyuki Tomiyama, Shigeru Yamashita and **Sudip Roy**, "Shape-Dependent Velocity based DropletRouting on MEDA Biochips", IEEE Access Journal, vol. 10, pp. 122423 - 122430, December, 2022. DOI: 10.1109/ACCESS.2022.3223054 [IF = 3.367; SJR: Q1]

[J27] Haris Rahadianto, Hirokazu Tatano, Masato Iguchi, Hiroshi L. Tanaka, Tetsuya Takemi and **Sudip Roy**, "Long-Term Ash Dispersal Dataset of the Sakurajima Taisho Eruption for Ashfall Disaster Countermeasure", Copernicus Journal of Earth System Science Data (ESSD), vol. 14(12), pp. 5309 - 5332, December, 2022. DOI: 10.5194/essd-2022-42 [IF = 10.92]

[J26] Debasis Gountia and **Sudip Roy**, "Design-for-Trust Techniques for Digital Microfluidic Biochip Layout with Error Control Mechanism", IEEE/ACM Transactions on Computational Biology and Bioinformatics (TCBB), vol. 19(3), pp. 1570 - 1582, May, 2022. DOI: 10.1109/TCBB.2021.3054622 [IF = 3.015; SJR: Q2]

[J25] Subhajyoti Samaddar, **Sudip Roy**, Fatima Akter and Hirokazu Tatano, "Diffusion of Disaster-Preparedness Information by Hearing from Early Adopters to Late Adopters in Coastal Bangladesh", MDPI Journal of Sustainability, vol. 14, no. 7, pp. 3897, 19 pages, March, 2022. DOI: 10.3390/su14073897 [IF = 3.889]

[J24] ♣★ Debraj Kundu, **Sudip Roy**, Sukanta Bhattacharjee, Sohini Saha, Krishnendu Chakrabarty, Partha P. Chakrabarti and Bhargab B. Bhattacharya, "Mixing Models as Integer Factorization: A Key to Sample Preparation with Microfluidic Biochips", IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (IEEE TCAD), vol. 41(3), pp. 558 - 570, January, 2021. DOI: 10.1109/TCAD.2021.3063342 [IF = 2.168; SJR: Q1]

[J23] Debasis Gountia and **Sudip Roy**, "Security Model for Protecting Intellectual Property of State-of-the-Art Microfluidic Biochips", Elsevier Journal of Information Security and Applications (JISA), vol. 58, pp. 102773, 15 pages, January, 2021. DOI: 10.1016/j.jisa.2021.102773 [IF = 2.327; SJR: Q1]

[J22] Debraj Kundu, Jitendra Giri, Sataru Maruyama, **Sudip Roy**, and Shigeru Yamashita, "Fluid-to-Cell Assignment and Fluid Loading on Programmable Microfluidic Devices for Bioprotocol Execution", Elsevier Integration, the VLSI Journal, vol. 78, pp. 95-109, May, 2021. DOI: 10.1016/j.vlsi.2020.12.004 [IF = 1.613; SJR: Q3]

[J21] Sumit Sharma and **Sudip Roy**, "Design of All-Optical Parallel-Multipliers using Semiconductor Optical Amplifier based Mach-Zehnder Interferometers", Springer Journal of Supercomputing (SUPE), vol. 77, pp. 7315–7350, January, 2021. DOI: 10.1007/s11227-020-03543-0 [IF = 2.469; SJR: Q2]

[J20] Sumit Sharma and **Sudip Roy**, "A Survey on Design and Synthesis Techniques for Photonic Integrated Circuits", Springer Journal of Supercomputing (SUPE), vol. 77, pp. 4332–4374, September, 2020. DOI: 10.1007/s11227-020-03430-8 [IF = 2.469; SJR: Q2]

[J19] Lingxuam Shao, Wentai Li, Tsung-Yi Ho, **Sudip Roy** and Hailong Yao, "Lookup Table Based Fast Reliability-Aware Sample Preparation using Digital Microfluidic Biochips", IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (IEEE TCAD), vol. 39(10), pp. 2708-2721, October, 2020. DOI: 10.1109/TCAD.2019.2948907 [IF = 2.878; SJR: Q1]

[J18] Nishant Kamal, Ankur Gupta, Ananya Singla, Shubham Tiwari, Parth Kohli, **Sudip Roy** and Bhargab B. Bhattacharya, "Architectural Design of Flow-based Microfluidic Biochips for Multi-Target Dilution of Biochemical Fluids", ACM Transactions on Design Automation of Electronic Systems (ACM TODAES), vol. 25(3), pp. 25.1-25.34, March, 2020. DOI: 10.1145/3357604 [IF = 1.232; SJR: Q2]

[J17] Ankur Gupta, Juinn-Dar Huang, Shigeru Yamashita and **Sudip Roy**, "Design Automation for Dilution of a Fluid Using Programmable Microfluidic Device-Based Biochips", ACM Transactions on Design Automation of Electronic Systems (ACM TODAES), vol. 24(2), pp. 21.1-21.24, February, 2019. DOI: 10.1145/3306492 [IF = 1.232; SJR: Q2]

[J16] Varsha Agarwal, Ananya Singla, Mahammad Samiuddin, **Sudip Roy**, Tsung-Yi Ho, Indranil Sengupta and Bhargab B. Bhattacharya, "Scheduling Algorithms for Reservoir- and Mixer-Aware Sample Preparation with Microfluidic Biochips", Integration, the VLSI Journal, vol. 65, pp. 428-443, March, 2019. DOI: 10.1016/j.vlsi.2018.01.002 [IF = 1.613; SJR: Q3]

[J15] Shalu, Srijan Kumar, Ananya Singla, **Sudip Roy**, Krishnendu Chakrabarty, Partha P. Chakrabarti and Bhargab B. Bhattacharya, "Demand-Driven Single- and Multi-Target Mixture Preparation using Digital Microfluidic Biochips", ACM Transactions on Design Automation of Electronic Systems (ACM TODAES), vol. 23(4), pp. 55.1-55.26, July, 2018. DOI: 10.1145/3200903 [IF = 1.232; SJR: Q2]

[J14] ✿ Ananya Singla, Varsha Agarwal, **Sudip Roy** and Arijit Mondal, "Reliability Analysis of Mixture Preparation using Digital Microfluidic Biochips", IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (IEEE TCAD), vol. 38(4), pp. 654-667, March, 2018. DOI: 10.1109/TCAD.2018.2819081 [IF = 2.878; SJR: Q1]

[J13] ★ Sukanta Bhattacharjee, Sudip Poddar, **Sudip Roy**, Juinn-Dar Huang and Bhargab B. Bhattacharya, "Dilution and Mixing Algorithms for Flow-Based Microfluidic Biochips", IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (IEEE TCAD), vol. 36(4), pp. 614-627, April, 2017. DOI: 10.1109/TCAD.2016.2597225 [IF = 2.878; SJR: Q1]

[J12] Ta-Yang Huang, Chia-Jui Chang, Chung-Wei Lin, **Sudip Roy**, and Tsung-Yi Ho, "Delay-Bounded Intra-Vehicle Network Routing Algorithm for Minimization of Wiring Weight and Wireless Transmit Power", IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (IEEE TCAD), vol. 36(4), pp. 551-561, April, 2017. DOI: 10.1109/TCAD.2016.2568203 [IF = 2.878; SJR: Q1]

[J11] Yu-Wei Wu, Yiyu Shi, **Sudip Roy**, and Tsung-Yi Ho, "Obstacle-Avoiding Wind Turbine Placement for Power Loss and Wake Effect Optimization", ACM Transactions on Design Automation of Electronic Systems (ACM TODAES), vol. 22(1), pp. 5.1-5.24, 2016. DOI: 10.1145/2905365 [IF = 1.232; SJR: Q2]

[J10] **Sudip Roy**, Partha P. Chakrabarti, Krishnendu Chakrabarty and Bhargab B. Bhattacharya, "Layout-Aware Mixture Preparation of Biochemical Fluids on Application-Specific Digital Microfluidic Biochips", ACM Transactions on Design Automation of Electronic Systems (ACM TODAES), vol. 20(3), pp. 45.1-45.34, June, 2015. DOI: 10.1145/2714562 [IF = 1.232; SJR: Q2]

[J9] **Sudip Roy**, Partha P. Chakrabarti, Krishnendu Chakrabarty and Bhargab B. Bhattacharya, "Waste-Aware Single-Target Dilution of a Biochemical Fluid using Digital Microfluidic Biochips", Elsevier Integration, the VLSI Journal, December, 2014. DOI: 10.1016/j.vlsi.2014.12.004 [IF = 1.613; SJR: Q3]

[J8] **Sudip Roy**, Bhargab B. Bhattacharya, Sarmishtha Ghoshal and Krishnendu Chakrabarty, "An Optimal Two-mixer Dilution Engine with Digital Microfluidics for Low-power Applications", ASP Journal of Low Power Electronics (JOLPE), Vol. 10(3), pp. 506-518, September, 2014. DOI: 10.1166/jolpe.2014.1335 [SJR: Q4]

[J7] **Sudip Roy**, Bhargab B. Bhattacharya, Sarmishtha Ghoshal and Krishnendu Chakrabarty, "Theory and Analysis of Generalized Mixing and Dilution of Biochemical Fluids using Digital Microfluidic Biochips", ACM Journal on Emerging Technologies in Computing Systems (ACM JETC), Vol. 11(1), pp. 2.1-2.33, September, 2014. DOI: 10.1145/2629578 [IF = 2.429; SJR: Q2]

[J6] Debasis Mitra, **Sudip Roy**, Sukanta Bhattacharjee, Krishnendu Chakrabarty, and Bhargab B. Bhattacharya, "On-Chip Sample Preparation for Multiple Targets using Digital Microfluidics", IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (IEEE TCAD), Vol. 33(8), pp. 1131-1144, August, 2014. DOI: 10.1109/TCAD.2014.2323200 [IF = 2.878; SJR: Q1]

[J5] **Sudip Roy**, Bhargab B. Bhattacharya, Sarmishtha Ghoshal, and Krishnendu Chakrabarty, "A High-Throughput Dilution Engine for Sample Preparation on Digital Microfluidic Biochips", Special Issue Journal of IET Computers & Digital Techniques (IET-CDT), Vol. 8(4), pp. 163-171, July, 2014. DOI: 10.1049/iet-cdt.2013.0060 [IF = 1.063; SJR: Q3]

[J4] **Sudip Roy**, Debasis Mitra, Bhargab B. Bhattacharya, and Krishnendu Chakrabarty, "Congestion-aware Layout Design for High-throughput Digital Microfluidic Biochips", ACM Journal on Emerging Technologies in Computing Systems (ACM JETC), Vol. 8(3), Article 17, August, 2012. DOI: 10.1145/2287696.2287700 [IF = 2.429; SJR: Q2]

[J3] ★ **Sudip Roy**, Bhargab B. Bhattacharya and Krishnendu Chakrabarty, "Optimization of Dilution and Mixing of Biochemical Samples using Digital Microfluidic Biochips", IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (IEEE TCAD), vol. 29(11), pp. 1696-1708, November, 2010. DOI: 10.1109/TCAD.2010.2061790 [IF = 2.878; SJR: Q1]

[J2] **Sudip Roy** and Ajit Pal, "A New Technique for Runtime Leakage Reduction and Its Sensitivity and Parametric Yield Analysis Under Effective Channel-length Variation", ASP Journal of Low Power Electronics (JOLPE), Vol. 6(1), pp.80-92, April, 2010. DOI: 10.1166/jolpe.2010.1058 [SJR: Q4]

[J1] Sarmishtha Ghoshal, Debasis Mitra, **Sudip Roy** and Dwijesh Dutta Majumder, "Biosensors and Biochips for Nanomedical Applications: a Review", Sensors and Transducers Journal (ISSN 1726-5479), Vol. 113(2), pp. 1-17, IFSA, February, 2010. Weblink

PUBLICATIONS IN PEER-REVIEWED INTERNATIONAL CONFERENCES

[*In this list, please note the following: (a) FIVE best publications in last FIVE years are marked with* ✿. *(b) FIVE most important publications are marked with* ★. *(c) Best FIVE are* highlighted.]

[C49] Surya Naga Aditya V. Dupukuntla, Koushik Sai Nimmaturi, Tamal Mandal, Sathwik Abramoni and **Sudip Roy**, "Efficient Dilution of a Fluid from its Related Arbitrary Stock Solutions using MEDA Biochips", accepted for publication in the 19th IEEE Asia Pacific Conference On Circuits And Systems (APCCAS), India, November, 2023.

[C48] Tanu Gupta and **Sudip Roy**, "Handcrafted Features Based Analysis of Social Media Images for Disaster Response", accepted for publication in the 8th International Conference on Information and Communication Technologies for Disaster Management (ICT-DM), Italy, September, 2023.

[C47] Sarthak Vage, Tanu Gupta and **Sudip Roy**, "Impact Analysis of Climate Change on Floods in an Indian Region using Machine Learning", accepted for publication in the 32nd International Conference on Artificial Neural Networks (ICANN), Greece, September, 2023. [ERA: B; Qualis: B1]

[C46] Ameya Gujar, Tanu Gupta and **Sudip Roy**, "Hybrid Model for Impact Analysis of Climate Change on Droughts in Indian Region", accepted for publication in the 9th International Conference on Machine Learning, Optimization, and Data Science (LOD), UK, September, 2023.

[C45] ✿ Debraj Kundu, Gadikoyila Satya Vamsi, Karnati Vivek Veman, Gurram Mahidhar and **Sudip Roy**, "Reinforcement Learning based Module Placement for Reliabile MEDA Digital Microfluidic Biochips", in Proc. of the 33rd ACM Great Lakes Symposium on VLSI (GLSVLSI), USA, June, 2023. DOI: 10.1145/3583781.3590209 [Qualis: B1]

[C44] Masataka Hirai, Debraj Kundu, Shigeru Yamashita, **Sudip Roy** and Hiroyuki Tomiyama, "Transport-Free Placement of Mixers for Realizing Bioprotocol on Programmable Microfluidic Devices", in Proc. of the 36th International Conference on VLSI Design (VLSID), pp. 193-198, India, 2023. DOI: 10.1109/VLSID57277.2023.00049 [ERA: C; Qualis: A2]

[C43] Debraj Kundu and **Sudip Roy**, "MEDA Biochip based Single-Target Fluidic Mixture Preparation with Minimum Wastage", in Proc. of the 25th Euromicro Conference on Digital System Design (DSD), Spain, 2022. DOI: 10.1109/DSD57027.2022.00113 [Qualis: B1] (**Outstanding Paper Award**)

[C42] Abhishek Ghosh, Debraj Kundu, Sudip Poddar, Shigeru Yamashita, Robert Wille and **Sudip Roy**, "Microfluidic Dilution by Recycling Arbitrary Stock Solutions using Various Mixing Models", in Proc. of the 5th International Symposium on Devices, Circuits and Systems (ISDCS), 14 pages, India, 2022. DOI: 10.1007/978-981-99-0055-8_11

[C41] Shuaijie Ying, **Sudip Roy**, Juinn-Dar Huang and Shigeru Yamashita, "Design for Restricted-Area and Fast Dilution using Programmable Microfluidic Device based Lab-on-a-Chip", in Proc. of the 24th Euromicro Conference on Digital System Design (DSD), pp. 488-494, Italy, 2021. DOI: 10.1109/DSD53832.2021.00079 [Qualis: B1]

[C40] Sumit Sharma and **Sudip Roy**, "Optical Waveguide Channel Routing with Reduced Bend-Loss for Photonic Integrated Circuits", in Proc. of the 34th International Conference on VLSI Design (VLSID), pp. 246-251, India, 2021. DOI: 10.1109/VLSID51830.2021.00047 [ERA: C; Qualis: A2]

[C39] Tanu Gupta and **Sudip Roy**, "A Hybrid Model Based on Fused Features for Detection of Natural Disasters from Satellite Images", in Proc. of the IEEE International Geoscience and Remote Sensing Symposium (IGARSS), pp. 1699-1702, USA, 2020. DOI: 10.1109/IGARSS39084.2020.9324611 [ERA: C; Qualis: B1]

[C38] Arun Kant Dwivedi, **Sudip Roy** and Dharmendra Singh, "An Adaptive Neuro-Fuzzy Approach for Decomposition of Mixed Pixels to Improve Crop Area Estimation Using Satellite Images", in Proc. of the IEEE International Geoscience and Remote Sensing Symposium (IGARSS), pp. 4191-4194, USA, 2020. DOI: 10.1109/IGARSS39084.2020.9323128 [ERA: C; Qualis: B1]

[C37] ✿★ Gautam Choudhary, Sandeep Pal, Debraj Kundu, Sukanta Bhattacharjee, Shigeru Yamashita, Bing Li, Ulf Schlichtmann and **Sudip Roy**, "Transport-Free Module Binding for Sample Preparation using Microfluidic Fully Programmable Valve Arrays", in Proc. of the IEEE/ACM Design, Automation and Test in Europe (DATE) Conference, pp. 1335-1338, France, 2020. DOI: 10.23919/DATE48585.2020.9116370 [ERA: B; Qualis: A1]

[C36] Satoru Maruyama, Debraj Kundu, Shigeru Yamashita and **Sudip Roy**, "Optimization of Fluid Loading on Programmable Microfluidic Devices for Bio-protocol Execution", in Proc. of the 25th Asia and South Pacific Design Automation Conference (ASP-DAC), pp. 550-555, 2020, China. DOI: 10.1109/ASP-DAC47756.2020.9045675 [Qualis: A2]

[C35] P. Sai Prasanth, Tanu Gupta and **Sudip Roy**, "Constrained Vehicle Route Planning and Optimization for Disaster Logistics Management", in Proc. of the 16th IEEE India Council International Conference (INDICON), pp. 1-4, 2019, India. DOI: 10.1109/INDI-CON47234.2019.9029103

[C34] Tanu Gupta, Vimala Nunavath and **Sudip Roy**, "CrowdVAS-Net: A Deep-CNN Based Framework to Detect Abnormal Crowd-Motion Behavior in Videos for Predicting Crowd Disaster", in Proc. of the 32nd IEEE International Conference on Systems, Man, and Cybernetics (IEEE SMC), pp. 2877-2882, 2019, Italy. DOI: 10.1109/SMC.2019.8914152 [ERA: B; Qualis: B2]

[C33] Naveen Gupta, Tanu Gupta, Subhajyoti Samaddar and **Sudip Roy**, "WebReLog: A Web-based Tool for Disaster Relief Logistics with Vehicle Route Planning", in Proc. of the 32nd IEEE International Conference on Systems, Man, and Cybernetics (IEEE SMC), pp. 1012-1017, 2019, Italy. DOI: 10.1109/SMC.2019.8913925 [ERA: B; Qualis: B2]

[C32] Debasis Gountia and **Sudip Roy**, "Design-for-Trust Technique for Microfluidic Biochip Layout", in Proc. of the 6th IEEE Region 10 Symposium (TENSYMP), pp. 704-709, 2019, India. DOI: 10.1109/TENSYMP46218.2019.8971286

[C31] Debasis Gountia and **Sudip Roy**, "Checkpoints Assignment on Cyber-Physical Digital Microfluidic Biochips for Early Detection of Hardware Trojans", in Proc. of the 3rd International Conference on Trends in Electronics and Informatics (ICOEI), pp. 16-21, April 23-25, 2019, Tamilnadu, India. DOI: 10.1109/ICOEI.2019.8862598

[C30] Sohini Saha, Debraj Kundu, **Sudip Roy**, Sukanta Bhattacharjee, Krishnendu Chakrabarty, Partha P. Chakrabarti and Bhargab B. Bhattacharya, "Factorization Based Dilution of Biochemical Fluids with Micro-Electrode-Dot-Array Biochips", in Proc. of the 24th Asia and South Pacific Design Automation Conference (ASP-DAC), pp. 462-467, 2019, Japan. DOI: 10.1145/3287624.3287710 [Qualis: A2]

[C29] Kanishk Lohumi and **Sudip Roy**, "Automatic Detection of Flood Severity Level from Flood Videos Using Deep Learning Models", in Proc. of the 5th International Conference on Information and Communication Technologies for Disaster Management (ICT-DM), pp. 1-7, 2018, Japan. DOI: 10.1109/ICT-DM.2018.8636373

[C28] Anirban Mitra, Arjun Sharma, Sumit Sharma and **Sudip Roy**, "Thermal Comfort Index Estimation and Parameter Selection using Fuzzy Convolutional Neural Network", in Proc. of the 27th International Conference on Artificial Neural Networks (ICANN), Part I, pp. 714–724, 2018, Greece. DOI: 10.1007/978-3-030-01418-6_70 [ERA: B; Qualis: B1]

[C27] Arjun Sharma, Anirban Mitra, Sumit Sharma and **Sudip Roy**, "Estimation of Air Quality Index from Seasonal Trends using Deep Neural Network", in Proc. of the 27th International Conference on Artificial Neural Networks (ICANN), Part III, pp. 511–521, 2018, Greece. DOI: 10.1007/978-3-030-01424-7_50 [ERA: B; Qualis: B1]

[C26] Sumit Sharma, Krishnendu Chakrabarty and **Sudip Roy**, "On Designing All-Optical Multipliers using Mach-Zender Interferometers", in Proc. of the 21st Euromicro Conference on Digital System Design (DSD), pp. 672–679, 2018, Czech Republic. DOI: 10.1109/DSD.2018.00113 [Qualis: B1]

[C25] Prasangsha Ganguly and **Sudip Roy**, "Post-Disaster Relief by Vehicle Route Planning and Service Time Estimation in Case of Chennai Floods", in Proc. of the Fourth International Conference on Information and Communication Technologies for Disaster Management (ICT-DM), pp. 672–679, 2017, Germany. DOI: 10.1109/ICT-DM.2017.8275694

[C24] Yu-Jhih Chen, Sumit Sharma, **Sudip Roy** and Tsung-Yi Ho, "Scheduling and Optimization of Genetic Logic Circuits on Flow-based Microfluidic Biochips", in Proc. of the International Conference on Design, Automation, and Test in Europe (DATE), pp. 1805-1810, 2017, Switzerland. DOI: 10.23919/DATE.2017.7927285 [ERA: B; Qualis: A1]

[C23] Wei-Lun Huang, Ankur Gupta, **Sudip Roy**, Tsung-Yi Ho and Paul Pop, "Fast Architecture-Level Synthesis of Fault-Tolerant Flow-Based Microfluidic Biochips", in Proc. of the International Conference on Design, Automation, and Test in Europe (DATE), pp. 1667-1672, 2017, Switzerland. DOI: 10.23919/DATE.2017.7927262 [ERA: B; Qualis: A1]

[C22] Varsha Agarwal, Ananya Singla, Mahammad Samiuddin, **Sudip Roy**, Tsung-Yi Ho, Indranil Sengupta and Bhargab B. Bhattacharya, "Reservoir and Mixer Constrained Scheduling for Sample Preparation on Digital Microfluidic Biochips", in Proc. of the 22nd Asia and South Pacific Design Automation Conference (ASP-DAC), pp. 702-707, 2017, Japan. DOI: 10.1109/ASP-DAC.2017.7858406 [Qualis: A2]

[C21] Satendra Kumar, Ankur Gupta, **Sudip Roy** and Bhargab B. Bhattacharya, "Design Automation of Multiple-Demand Mixture Preparation using a K-Array Rotary Mixer on Digital Microfluidic Biochips", in Proc. of the 34th IEEE International Conference on Computer Design (ICCD), pp. 273-280, 2016,USA. DOI: 10.1109/ICCD.2016.7753290 [Qualis: A2]

[C20] Tsung-Yi Ho, Shigeru Yamashita, Ansuman Banerjee and **Sudip Roy**, "Design of Microfluidic Biochips: Connecting Algorithms and Foundations of Chip Design to Biochemistry and the Life Sciences (Special Session)", in Proc. of the 29th International Conference on VLSI Design (VLSID), pp. 59-62, 2016, India. DOI: 10.1109/VLSID.2016.152 [ERA: C; Qualis: A2]

[C19] Ta-Yang Huang, Chia-Jui Chang, Chung-Wei Lin, **Sudip Roy** and Tsung-Yi Ho, "Intra-Vehicle Network Routing Algorithm for Weight and Wireless Transmit Power Minimization", in Proceedings of the 20th Asia and South Pacific Design Automation Conference (ASP-DAC), pp. 273-278, 2015, Japan. DOI: 10.1109/ASPDAC.2015.7059017 [Qualis: A2]

[C18] Yu-Wei Wu, Yiyu Shi, **Sudip Roy** and Tsung-Yi Ho, "Obstacle-Avoiding Wind Turbine Placement for Power-Loss and Wake-Effect Optimization", in Proc. of the 20th Asia and South Pacific Design Automation Conference (ASP-DAC), pp. 202-207, 2015, Japan. DOI: 10.1109/ASP-DAC.2015.7059005 [Qualis: A2]

[C17] **Sudip Roy**, Chi-Ruo Wu and Tsung-Yi Ho, "Recent Trends in Chip-Level Design Automation for Digital Microfluidic Biochips", in Proc. of the 14th International Symposium on Integrated Circuits (ISIC), pp. 360-365, 2014, Singapore. DOI: 10.1109/ISICIR.2014.7029546

[C16] ★ **Sudip Roy**, Srijan Kumar, Partha P. Chakrabarti, Bhargab B. Bhattacharya and Krishnendu Chakrabarty, "Demand-Driven Mixture Preparation and Droplet Streaming using Digital Microfluidic Biochips", in Proc. of the ACM/IEEE Design Automation Conference (DAC), pp. 1-6, 2014, USA. DOI: 10.1145/2593069.2593119 [ERA: C; Qualis: A1]

[C15] Bhargab B. Bhattacharya, **Sudip Roy** and Sukanta Bhattacharjee, "Algorithmic Challenges in Digital Microfluidic Biochips: Protocols, Design, and Test", Invited Paper in the International Conference on Applied Algorithms (ICAA), Lecture Notes in Computer Science, Volume 8321, pp. 1-16, 2014, India. DOI: 10.1145/2287696.2287700

[C14] **Sudip Roy**, Bhargab B. Bhattacharya, Sarmishtha Ghoshal and Krishnendu Chakrabarty, "Optimal Two-Mixer Scheduling in Dilution Engine on a Digital Microfluidic Biochip", in Proc. of the Fourth International Symposium on Electronic System Design (ISED), pp. 82-86, 2013, Singapore. DOI: 10.1109/ISED.2013.23

[C13] **Sudip Roy**, Partha P. Chakrabarti, Srijan Kumar, Bhargab B. Bhattacharya and Krishnendu Chakrabarty, "Routing-aware Resource Allocation for Mixture Preparation in Digital Microfluidic Biochips", in Proc. of the IEEE International Symposium on VLSI (ISVLSI), pp. 165-170, 2013, Brazil. DOI: 10.1109/ISVLSI.2013.6654653 [Qualis: B1]

[C12] **Sudip Roy**, Bhargab B. Bhattacharya, Sarmishtha Ghoshal and Krishnendu Chakrabarty, "On-Chip Dilution from Multiple Concentrations of a Sample Fluid using Digital Microfluidics", in Proc. of the Seventeenth International Symposium on VLSI Design and Test (VDAT), pp. 274-283, 2013, India. DOI: 10.1007/978-3-642-42024-5_33

[C11] Srijan Kumar, **Sudip Roy**, Partha P. Chakrabarti, Bhargab B. Bhattacharya and Krishnendu Chakrabarty, "Efficient Mixture Preparation on Digital Microfluidic Biochips", in Proc. of the 16th IEEE Symposium on Design and Diagnostics of Electronic Circuits and Systems (DDECS), pp. 205-210, 2013, Czech Republic. DOI: 10.1109/DDECS.2013.6549817 [Qualis: B3]

[C10] **Sudip Roy**, Bhargab B. Bhattacharya, Sarmishtha Ghoshal and Krishnendu Chakrabarty, "Low-Cost Dilution Engine for Sample Preparation using Digital Microfluidic Biochips", in Proc. of the Third International Symposium on Electronic System Design (ISED), pp. 203-207, 2012, India. DOI: 10.1109/ISED.2012.70

[C9] **Sudip Roy**, Partha P. Chakrabarti and Bhargab B. Bhattacharya, "Algorithms for On-Chip Solution Preparation using Digital Microfluidic Biochips", in Proc. of the IEEE International Symposium on VLSI (ISVLSI), pp. 7-8, 2012, USA. DOI: 10.1109/ISVLSI.2012.79 [Qualis: B1]

[C8] Debasis Mitra, **Sudip Roy**, Krishnendu Chakrabarty and Bhargab B. Bhattacharya, "On-Chip Sample Preparation with Multiple Dilutions Using Digital Microfluidics", in Proc. of the IEEE International Symposium on VLSI (ISVLSI), pp. 314-319, 2012, USA. DOI: 10.1109/ISVLSI.2012.52 [Qualis: B1]

[C7] **Sudip Roy**, Bhargab B. Bhattacharya and Krishnendu Chakrabarty, "Waste-Aware Dilution and Mixing of Biochemical Samples with Digital Microfluidic Biochips", in Proc. of the IEEE/ACM Design, Automation and Test in Europe (DATE) Conference, pp. 1059-1064, 2011, France. DOI: 10.1109/DATE.2011.5763174 [ERA: B; Qualis: A1]

[C6] **Sudip Roy**, Bhargab B. Bhattacharya, Partha P. Chakrabarti and Krishnendu Chakrabarty, "Layout-Aware Solution Preparation for Biochemical Analysis on a Digital Microfluidic Biochip", in Proc. of the IEEE International Conference on VLSI Design (VLSID), pp. 171-176, 2011, India. DOI: 10.1109/VLSID.2011.55 [ERA: C; Qualis: A2]

[C5] **Sudip Roy**, Debasis Mitra, Bhargab B. Bhattacharya and Krishnendu Chakrabarty, "Pin-Constrained Designs of Digital Microfluidic Biochips for High-Throughput Bioassays", in Proc. of the IEEE International Symposium on Electronic System Design (ISED), pp. 4-9, 2010, India. DOI: 10.1109/ISED.2010.10

[C4] Sujan Kundu, **Sudip Roy** and Ajit Pal, "A Power-Aware Wireless Sensor Network Based Bridge Monitoring System", in Proc. of the Sixteenth IEEE International Conference on Networks (ICON), pp. 1-7, 2008, India. DOI: 10.1109/ICON.2008.4772584 [ERA: B; Qualis: B3]

[C3] **Sudip Roy** and Ajit Pal, "Impact of Runtime Leakage Reduction Techniques on Delay and Power Sensitivity under Effective Channel Length Variations', in Proc. of IEEE Region 10 Conference (TENCON), 2008, India. DOI: 10.1109/TENCON.2008.4766400 [ERA: C]

[C2] **Sudip Roy**, Indranil Sengupta and Ajit Pal, "Artificial Intelligence Approach to Test Vector Reordering for Dynamic Power Reduction during VLSI Testing", in Proc. of IEEE Region 10 Conference (TENCON), 2008, India. DOI: 10.1109/TENCON.2008.4766747 [ERA: C]

[C1] **Sudip Roy** and Ajit Pal, "Why to use Dual-Vt, if Single-Vt serves the purpose better under Process Parameter Variations?", in Proc. of the Eleventh Euromicro conference on Digital System Design (DSD), pp. 282-289, 2008, Italy. DOI: 10.1109/DSD.2008.37 [Qualis: B1]

WORKSHOP AND FORUM PRESENTATIONS

[W7] Masataka Hirai, Shigeru Yamashita, **Sudip Roy** and Hiroyuki Tomiyama, "Binding and Scheduling of 2×3 Mixers for Transport-Free Sample Preparation Using Programmable Microfluidic Devices," in Proc. of the 24th Workshop on Synthesis And System Integration of Mixed Information technologies (SASIMI), pp. 32-37, Japan, 2022. Weblink

[W6] Shuaijie Ying, Shigeru Yamashita, **Sudip Roy** and Juinn-Dar Huang, "Restricted-Area and Fast Sample Preparation of a Fluid using Programmable Microfluidic Devices," in Proc. of the IEICE Technical Report, vol. 120, no. 234, VLD2020-25, pp. 84-89, 2020. Weblink

[W5] Yuto Umeda, **Sudip Roy** and Shigeru Yamashita, "Mixing of Biochemical Fluids using Programmable Microfluidic Devices", in Proc. of the 22nd Workshop on Synthesis And System Integration of Mixed Information technologies (SASIMI), pp. 144-149, Taiwan, 2019. Weblink

[W4] Shuaijie Ying, **Sudip Roy**, Juinn-Dar Huang and Shigeru Yamashita, "Sample Preparation with Efficient Dilution of Biochemical Fluids using Programmable Microfluidic Devices", in Proc. of the 22nd Workshop on Synthesis And System Integration of Mixed Information technologies (SASIMI), pp. 122-125, Taiwan, 2019. Weblink

[W3] Satoru Maruyama, Ankur Gupta, **Sudip Roy** and Shigeru Yamashita, "Placement of Reagents on Programmable Microfluidic Devices", in Proc. of the 21st Workshop on Synthesis And System Integration of Mixed Information technologies (SASIMI), pp. R2-1, Japan, 2018. Weblink (**Outstanding Paper Award**)

[W2] **Sudip Roy**, "Algorithms for Design Automation of Sample Preparation on Digital Microfluidic Biochips", presented in the PhD Forum at the IEEE/ACM Design, Automation and Test in Europe (DATE) Conference, Germany, 2014. Weblink [ERA: B; Qualis: A1]

[W1] **Sudip Roy**, "Algorithms for Automatic Sample Preparation on Digital Microfluidic Biochips", Poster Presentation in the SELECTBIO Conference Microfluidics and Lab-on-a-Chip India, India, 2013. Weblink (**Best Poster Award**)

THESIS GUIDANCE IN IIT ROORKEE, INDIA

- **Two PhD Students Graduated**:
  (1) Dr. Debasis Gountia graduated in Aug 2021; Thesis Title: "Some Mechanisms Towards Improving Security of Microfluidic Biochips" [published 2 journal papers and 2 conference papers; currently working as an Associate Professor in College of Engineering and Technology, Bhubaneswar, Orisha, India]
  (2) Dr. Sumit Sharma graduated in Jan, 2023; Thesis Title: "A Study on Designing All-Optical Multipliers and Optical Channel Routing in Photonic Integrated Circuits" [published 3 journal papers and 5 conference papers; currently working as an Assistant Professor in Thapar Institute of Engineering & Technology, Patiala, Punjab, India]
- **One Student Submitted PhD thesis**:
  (1) Mr. Debraj Kundu submitted thesis in Jul, 2023; Thesis Title: "Design Automation Issues and Their Solutions for Implementation of Bioprotocols using Advanced Microfluidic Biochips" [published 3 journal papers and 7 conference papers]
- **Advising Five PhD Students**:

- One PhD student under sole guidance in CoEDMM: Mrs. Tanu Gupta, CoEDMM, IIT Roorkee (Jul, 2019 - Ongoing), Topic: "Application of Machine Learning for Disaster Risk Reduction" [published 7 conference papers to date]
- One PhD student jointly guided by me with other faculties in Dept. of CSE: Ms. Khadijah Febriana, Dept. of CSE, IIT Roorkee (Aug, 2020 - Ongoing), Topic: "Internet-of-Things for Smart Agriculture and Farming"
- One PhD student under sole guidance in Dept. of CSE: Mr. Tamal Mandal, Dept. of CSE, IIT Roorkee (Jan, 2022 - Ongoing), Topic: "Design automation for microfluidic biochips"
- One PhD student under sole guidance in Dept. of CSE: Ms. Ankita Agrawal, Dept. of CSE, IIT Roorkee (Jan, 2023 - Ongoing), Topic: "Design automation for microfluidic biochips"
- One PhD student under sole guidance in CoEDMM: Ms. Prathibha Prakash, CoEDMM, IIT Roorkee (Jul, 2023 - Ongoing), Topic: "GIS and AI based Study of Climate Change Impacts on Natural Disasters in Indian Himalayan Region"

- Masters thesis supervision: Total 22 master's students graduated during 2016-2023. Currently, 4 masters' students are working for final year thesis during 2023-2024.
- UG final year dissertation supervision: Total 37 UG students graduated during 2015-2023. Currently, 9 UG students are working for final year thesis during 2023-2024.

TEACHING IN IIT ROORKEE, INDIA

- Post-Graduate (PG) or Masters level courses taught in Dept. of CSE, CoEDMM and MFSDSAI
  (1) **Computational Geometry (CSN-523)**: 2021-2022, 2020-2021, 2017-2018, 2016-2017, 2015-2016, 2014-2015
  (2) **Advanced Algorithms (CSN-501)**: 2017-2018
  (3) **Algorithms and Foundations for Chip Design (CSN-524)**: 2016-2017
  (4) **Mobile and Pervasive Computing (CSN-521)**: 2019-2020
  (5) **Instrumentation and Data Mining Techniques (DMN-604)**: 2018-2019, 2017-2018
  (6) **Advanced Data Structures and Algorithms (AID-507)**: 2023-2024, 2022-2023
- Under-Graduate (UG) courses taught in Dept. of CSE
  (1) **Computer Architecture and Microprocessors (CSN-221)**: 2018-2019, 2016-2017, 2015-2016, 2014-2015
  (2) **Compiler Design (CSN-352)**: 2022-2023
  (3) **System Software (CSN-252)**: 2018-2019
  (4) **Design and Analysis of Algorithms (CSN-212)**: 2015-2016
  (5) **Introduction to Computer Science and Engineering (CSN-101)**: 2019-2020, 2017-2018
  (6) **Probability Theory for Computer Engineering (CSN-373)**: 2023-2024, 2022-2023
  (7) **Data Structures Laboratory (CSN-261)**: 2020-2021, 2019-2020
  (8) **Computer Networks Laboratory (CSN-361)**: 2023-2024, 2020-2021, 2019-2020

OUTREACH FROM RESEARCH ACTIVITIES

- Organized and delivered talk in the opening Tutorial Session in the 28th Asia and South Pacific Design Automation Conference (ASP-DAC) 2023 held in Tokyo, Japan during Jan 16-19, 2023. Tutorial Title: "Optimization Problems for Design Automation of Microfluidic Biochips: Scope of Machine Learning" and Co-Speakers: Shigeru Yamashita (Ritsumeikan University, Japan) and Debraj Kundu (Indian Institute of Technology Roorkee, India)

PROFESSIONAL MEMBERSHIPS AND AFFILIATIONS

- Member of IEEE and ACM
- Visiting Professor (through virtual mode) in the Department of Computer Science and Technology, Tsinghua University, Beijing, China in 2020 [Host researcher: Dr. Hailong Yao]
- Visiting Research Scholar in the Disaster Prevention Research Institute (DPRI), Kyoto University, Kyoto, Japan in 2020 [Host researchers: Professor Hirokazu Tatano and Dr. Subhajyoti Samaddar]
- Served as a Guest Editor of the VDAT 2017 Special Issue in the American Scientific Publishers (ASP) Journal of Low Power Electronics (JOLPE), Vol. 14, No. 2, Jun, 2018
- Served as an Associate (Guest) Editor of the IEEE Access Special Section: System-Level Design Automation Methods for Multi-Processor System-on-Chips (2016 - 2017)
- Served as a Publication Co-Chair in the 21st International Symposium on VLSI Design and Test (VDAT 2017) held in IIT Roorkee, India
- Served as reviewer of some reputed journals: IEEE TCAD, IEEE TC, IEEE TKDE, IEEE TBio-CAS, IEEE Access, ACM JETC, ACM TECS, ACM TODAES, Springer JETTA, Springer Journal of Microfluidics and Nanofluidics, Springer Journal of Supercomputing, Springer SN Computer Science, Elsevier Integration the VLSI Journal, Elsevier Microelectronics Journal, Elsevier Journal of Hydrology, Elsevier Journal Optik

- Served as program committee member of some reputed conferences: ASPDAC, VLSID, DSD, VDAT, IEEE iNIS, HiPC, MIKE
- Served as reviewer of some reputed conferences: ACM/IEEE DAC, ASPDAC, VLSID, VDAT, IEEE ISVLSI, IEEE BioCAS ICANN ICT-DM

MAJOR SERVICES IN IIT ROORKEE, INDIA

- Received financial assistance for modernization and establishment of laboratories on smart system designs using Arduino and Raspberry-Pi kits in the Dept. of CSE under the scheme of "Modernization of Under-Graduate Laboratories (MUGL)" sponsored by IIT Roorkee. Total Grant: ∼**14800K INR ≈ 199K US**$ (one time grant in Aug 2019)
- Established a new research laboratory namely "Computing and Design Automation (CoDA) Laboratory" in Dept. of CSE in May 2016
- Designed a new PG elective course "Algorithms and Foundations for Chip Design" including practical sessions (laboratory classes) in Dept. of CSE in Jan 2016

PUBLICATION SUMMARY

- Total Number of US Patents Granted: 2
- Total Number of Indian Patent Granted: 1
- Total Number of Book, Book Chapter and Special Issue Articles: 3
- Total Number of Papers in International Peer-Reviewed Journals: 31
- Total Number of Papers in International Peer-Reviewed Conferences: 49
- Google Scholar Citation: Count = 941; H-index = 16; i10-index = 28 [As on Aug 21, 2023]

Date: Aug 21, 2023

(**Sudip Roy**)