SIT 102
Department of Computer Science
IIT Delhi Hauz Khas New Delhi INDIA
(+91) 9891942310
kolin.paul@gmail.com
www.cse.iitd.ac.in/~kolin
H-index: 28 (link)
i10-index: 74 (link)

Kolin Paul

Curriculum Vitae

Research Interests

Heterogeneous Architectures, Accelerators, Quantum Logic Synthesis , Quantum Compilers , Cyber Resilience

Education

2002 **PhD in Computer Science**, *Bengal Engineering College (Deemed University)* , Kolkata, India.

1995 **Masters in Electronics & Telecommunication Engineering**, *Jadavpur University*, Kolkata, India.

1992 **Bachelors in Electronics & Telecommunication Engineering**, *Regional Engineering College (NIT)*, Silchar, India.

Experience

Current

Mar'24- **Adjunct Professor** , School of Information Technology (SIT), Delhi.

Jul'23- **Adjunct Professor** , Institute of Liver & Biliary Sciences, Delhi.

Jan'17- **Professor** , Dept of Computer Science & Engineering (CSE), IIT Delhi.

Previous

Sep'21-Aug'23 **Head** , School of Information Technology (SIT), IIT Delhi.

Jun'19-Jun'24 **Microsoft Chair Professor** , IIT Delhi.

Sep'18-Aug'19 **Research Professor** , School of IT, TalTech, Tallinn, Estonia.

Sep'16-Aug'17 **Head** , Education Technology Services Center (ETSC), IIT Delhi.

Dec'10–Jan'17 **Associate Professor** , Dept of Computer Science and Engineering (CSE), IIT Delhi.

Aug'12–Jun'13 **Associate Professor** , Dept of Computer Science and Engineering (CSE), IIT Bombay.

May'04–Aug'10	**Assistant Professor** , Dept of Computer Science and Engineering (CSE), IIT Delhi.
Aug'10–Nov'10	**Visiting Researcher** , Dept of ICT, KTH, Stockholm, Sweden.
Jul'03–May'04	**Lecturer**, Dept of Computer Science and Engineering (CSE), University of Bristol, UK.
Jan'02–Jun'03	**Visiting Researcher**, Dept of Computer Science and Engineering (CSE), Colorado State University, Fort Collins, USA.
Dec'00-Jan'02	**Senior Software Engineer (Technical lead)**, IBM Software Labs India, Bangalore, India.
Dec'97-Dec'00	**Research Scientist**, BE College Shibpur, Kolkata, India.
Aug'95-Dec'97	**Lecturer**, REC Silchar, Silchar, India.

Awards

2019	Microsoft Chair Professorship
2010	STINT Fellowship 2010
2010	India EU Faculty Fellowship 2010
2010	Best Paper Award TRANSED 2010
2005	VASVIK Award (Electrical & Electronic Sciences & Technology) 2005, shared with PV Madhusudhan Rao, M Balakrishnan and Dipendra Manocha

PhD Thesis

Title	*Theory and Applications of GF(2^p) Cellular Automata*
Supervisors	Professor P Pal Chaudhuri & Professor D Roy Chowdhury

Summary of Research, Teaching and Admin

Publications	Refered Journals: 50
	Refereed Conferences : 115
	Books : 3
	Book Chapter: 2
	Patents 7 [*Filed and granted*]
	h-Index: 28 Citations: 2591 [Google Scholar]
Projects	Value [IRD Data]: INR 36,59,46,081
	Sponsored Research [IRD Data] : 32
	Consulting [IRD Data] : 5
	MI Projects [IRD Data] :13
Students	PhD: *Graduated* : 12 [IITD] 2 [KTH] *Ongoing*: 2
	DM : 2

Administration	Head: ETSC, SIT
	DRC Chair: CSE, SIT

Publications

Google Scholar:

H-index: 28 (link)
i10-index: 74 (link)

Books

3 Event-triggered Transmission Protocol in Robust Control Systems Niladri Sekhar Tripathy, Indra Narayan Kar, Kolin Paul CRC Press 2022

2 Architecture Exploration of FPGA Based Accelerators for BioInformatics Applications, Sharat Chandra Varma Bogaraju, Kolin Paul, M Balakrishnan, Springer ISBN 978-981-10-0589-3 April 2016

1 Algebra of Majority Logic, Rajeswari D, Kolin Paul, M Balakrishnan, Springer(*in print)*

Referred Book Chapter

2 Yadav, G., Paul, K., Gauravaram, P. (2022). Vulnerability Management in IIoT-Based Systems: What, Why and How. In: Pal, S., Jadidi, Z., Foo, E. (eds) Secure and Trusted Cyber Physical Systems. Smart Sensors, Measurement and Instrumentation, vol 43. Springer, Cham https://doi.org/10.1007/978-3-031-08270-2_3

1 Kolin Paul and Sanjay Rajopadhye, " Back Propagation Algorithm: Achieving 5 GOPS on the Virtex-E" Book Chapter in FPGA Implementations of Neural Networks By Amos R. Omondi; Jagath C. Rajapakse (Eds.). 0-387-28485-0 March, 2006.

Refereed Journals

50 Vatsal Agarwal, Vijay Kumar, Swati, Rohan Chawla and Kolin Paul: "NetraDeep: An Integrated Deep Learning and Image Processing System for Precise Detection of Hard Exudates" , ACM Transactions on Computing for Healthcare, (accepted) 2024

49 Kirti Gupta, Bijaya Ketan Panigrahi, Anupam Joshi, Kolin Paul: Demonstration of Denial of Charging Attack on Electric Vehicle Charging Infrastructure and its consequences. Int. J. Crit. Infrastructure Prot. 46: 100693 (2024)

48 A Choudhury, B Mondal, K Paul, BK Sikdar Designing a Deep Neural Network engine for LLC block reuse prediction to mitigate Soft Error in Multicore Microelectronics Reliability 156, 115377

47 SW Kibret, K Paul, VJ Ribeiro : AI-Powered Security for IoT: A Blockchain Enabled Device Twin Approach IntechOpen 2023

46 Vaibhav Deorari, Debashish Chowdhury, Kolin Paul, Pritesh Srivastava, Ashish Duggal , Development of a branching logic questionnaire and a Computer Based Assessment Tool (COMBAT) for Android based smartphones for the diagnosis of primary headache disorders using International classification of Headache Disorders third version (ICHD3), CEPHALALGIA 2023

45 Vijay Kumar, Kolin Paul: Device Fingerprinting for Cyber-Physical Systems: A Survey. ACM Comput. Surv. 55(14s): 302:1-302:41 (2023)

44 Vijay Kumar, and Kolin Paul. Fundus Imaging-based Healthcare: Present and Future. ACM Transactions on Computing in Healthcare 4(3): 16:1-16:34 (2023). https://doi.org/10.1145/3586580

43 Vijay Kumar, Het Patel, Kolin Paul, and Shorya Azad. Deep Learning Assisted Retinopathy of Prematurity (ROP) Screening. ACM Transactions in Computing in Healthcare Accepted 4(3): 18:1-18:32 (2023) https://doi.org/10.1145/3596223

42 Vijay Kumar, Het Patel, Kolin Paul and Shorya Azad. Improved Blood Vessels Segmentation of Infant Retinal Image. In:, et al. (eds) Biomedical Engineering Systems and Technologies. BIOSTEC 2022. Communications in Computer and Information Science. Springer, Berlin, Heidelberg (accepted 2023)

41 Avishek Choudhury, Brototi Mondal, Kolin Paul, Biplab K Sikdar: Energy Efficiency in Multicore Shared Cache by Fault Tolerance Using a Genetic Algorithm Based Block Reuse Predictor, Microprocessors and Microsystems, 2023

40 Astha Chawla, Prakhar Agrawal, Bijaya Ketan Panigrahi, Kolin Paul : Deep-Learning-Based Data-Manipulation Attack Resilient Supervisory Backup Protection of Transmission Lines. Neural Computing Applications, 2023

39 Saurabh Tewari, Anshul Kumar, Kolin Paul: Minimizing Off-Chip Memory Access for CNN Accelerators. IEEE Consumer Electron. Mag. 11(3): 95-104 (2022)

38 Geeta Yadav, Praveen Gauravaram, Arun Kumar Jindal, Kolin Paul: SmartPatch: A Patch Prioritization Framework. Computers in Industry. 137: 103595 (2022)

37 Astha Chawla, Animesh Singh, Prakhar Agrawal, Bijaya Ketan Panigrahi, Bhavesh R. Bhalja, Kolin Paul: Denial-of-Service Attacks Pre-Emptive and Detection Framework for Synchrophasor Based Wide Area Protection Applications. IEEE Syst. J. 16(1): 1570-1581 (2022)

36 Ekaterina Avershina, Priyanka Sharma, Arne M. Taxt, Harpreet Singh, Stephan A. Frye, Kolin Paul, Arti Kapil, Umaer Naseer, Punit Kaur, Rafi Ahmad, AMR-Diag: Neural network based genotype-to-phenotype prediction of resistance towards β-lactams in Escherichia coli and Klebsiella pneumoniae, Computational and Structural Biotechnology Journal, Volume 19, 2021

35 Rajesh Kedia, Shikha Goel, M. Balakrishnan, Kolin Paul, Rijurekha Sen: Design Space Exploration of FPGA-Based System With Multiple DNN Accelerators. IEEE Embed. Syst. Lett. 13(3): 114-117 (2021)

34 Vijay Kumar, Het Patel, Kolin Paul, A Surve, Shorya Azad. and R Chawla: DL-Assisted ROP Screening Technique. In: C. Gehin et al. (eds) Biomedical Engineering Systems and Technologies. BIOSTEC 2021. Communications in Computer and Information Science 1710, pp. 1-23, 2022. Springer, Berlin, Heidelberg. https://doi.org/ 10.1007/978-3-031-20664-1 13

33 Ahmed Hemani, Muhammad Shafique, Kolin Paul: Guest Editorial: Special Issue on Architectures and Design Methods for Neural Networks. J. Signal Process. Syst. 92(11): 1215-1217 (2020)

32 Geeta Yadav, Kolin Paul: Architecture and security of SCADA systems: A review. Int. J. Crit. Infrastructure Prot. 34: 100433 (2021)

31 Geeta Yadav, Kolin Paul, Alaa Allakany, Koji Okamura: "IoT-PEN: An E2E Penetration Testing Framework for IoT", J. Inf. Process. 28: 633-642 (2020)

30 Astha Chawla, Prakhar Agrawal, Animesh Singh, Bijaya Ketan Panigrahi, Kolin Paul, Bhavesh R. Bhalja: Denial-of-Service Resilient Frameworks for Synchrophasor-Based Wide Area Monitoring Systems. IEEE Computer 53(5): 14-24 (2020)

29 Rajeswari Devadoss, Kolin Paul, M. Balakrishnan: Equivalence Checking and Compaction of n-input Majority Terms Using Implicants of Majority. J. Electronic Testing 35(5): 679-694 (2019)

28 Samuel P Wedaj, Kolin Paul and Vinay J Ribeiro, "DADS: Decentralized Attestation for Device Swarms" ACM Transactions on Privacy and Security 22(3): 19:1-19:29 (2019)

27 Madhusudana Girija Sanal, Kolin Paul, Senthil Kumar, Nirmal Kumar Ganguly:" Artificial Intelligence and Deep Learning: the Future of Medicine and Medical Practice", Journal of The Association of Physicians of India, Vol. 67, May 2019

26 Pei Liu, Ahmed Hemani, Kolin Paul, Christian Weis, Matthias Jung, Norbert Wehn: "3D-Stacked Many-Core Architecture for Biological Sequence Analysis Problems". International Journal of Parallel Programming 45(6): 1420-1460 (2017)

25 Sharat Chandra Varma Bogaraju, Kolin Paul, Balakrishnan M, Dominique Lavenier, "Hardware Acceleration of De Novo Genome Assembly", International Journal of Embedded Systems, 74-89 (2017)

24 Pei Liu, Ahmed Hemani, Kolin Paul, Christian Weis, Matthias Jung, Norbert Wehn: "3D-Stacked Many-Core Architecture for Biological Sequence Analysis Problems". International Journal of Parallel Programming 45(6): 1420-1460 (2017)

23 Niladri Sekhar Tripathy, I. N. Kar, Kolin Paul: "Stabilization of Uncertain Discrete-Time Linear System With Limited Communication". IEEE Trans. Automat. Contr. 62(9): 4727-4733 (2017)

22 Pei Liu, Ahmed Hemani, Kolin Paul, Christian Weis, Matthias Jung, Norbert Wehn, "A Customized Many-Core Hardware Acceleration Platform for Short Read Mapping Problems Using Distributed Memory Interface with 3D-Stacked Architecture" Signal Processing Systems 87(3): 327-341 (2017)

21 Niladri Tripathi, I N Kar and Kolin Paul, "Model Based Robust Control Law for Linear Event-triggered System", Asian Journal of Control December 2015 (online) DOI: 10.1002/asjc.1276

20 Avval Gupta, Anju Kansal, Kolin Paul and Sanjiva Prasad, "A Modular Android based Multi Sensor mHealth System" Springer Communications in Computer and Information Science Volume 511 of the series Communications in Computer and Information Science pp 360-377 January 2016

19 Rajesh Kumar Pal, Ierum Shanaya, Kolin Paul and Sanjiva Prasad, "Dynamic Core Allocation for Energy-Efficient Video Decoding on Embedded Multicore Platforms", Future Generation Computer Systems Springer 56, 247-261, 2016

18 Tripathi M, Deo RC, Suri A, Srivastav V, Baby B, Kumar S, Kalra P, Banerjee S, Prasad S, Paul K, Roy TS, Lalwani S. "Design and Validation of an Open Source Partial Task Trainer for Endonasal Neuro-endoscopic Skills Development: Indian Experience", World Neurosurgery. 2016 Feb;86:259-69. doi: 10.1016/j.wneu.2015.09.045. Epub 2015 Sep 26.

17 Arun Parakh, M. Balakrishnan, Kolin Paul,“Improving Map-Reduce for GPUs with cache", International Journal of High Performance System Architecture (IJHPSA) Volume 5 Issue 3, July 2015

16 Syed Mohammad Asad Hassan Jafri, Ahmed Hemani, Kolin Paul, ,Juha Plosila and Hannu Tenhunen “Polymorphic Configuration Architecture for Coarse Grained Reconfigurable Architectures" IEEE Transactions on Very Large Scale Integration (VLSI) Systems Page 403-407 Jan. 2016

15 Syed Mohammad Asad Hassan Jafri, Ozan Ozbag, Nasim Farahini, Ahmed Hemani, Kolin Paul, Juha Plosila and Hannu Tenhunen “Architecture and Implementation of Dynamic Parallelism, Voltage and Frequency Scaling on CGRAs" ACM Journal on Emerging Technologies in Computing Systems (JETC) - Special Issue on Neuromorphic Computing and Emerging Many-Core Systems for Exascale Computing, Volume 11 Issue 4, April 2015

14 Anusha Subhramony Iyer and Kolin Paul, “Self-Assembly: A Review of Scope and Applications" IET Nanobiotechnology. June 2015 ;9(3):122-35.

13 Nasim Farahini, Ahmed Hemani, Hasan Sohofi, Syed Mohammad Asad Hassan Jafri, Muhammad Adeel Tajammul, Kolin Paul “Parallel Distributed Scalable Address Generation Scheme for a Coarse Grain Reconfigurable Computation and Storage Fabric", Microprocessors and Microsystems - Embedded Hardware Design 38(8): 788-802 (2014)

12 Rajesh Kumar Pal, Kolin Paul and Sanjiva Prasad, “A High Performance Reconfigurable ManyCore Architecture", J. Parallel Distrib. Comput. 74(11): 3071-3086 (2014)

11 Manish Kumar Jaiswal, Ray C.C. Cheung, M. Balakrishnan and Kolin Paul, “Unified Architecture for Double / Two-Parallel Single Precision Floating Point Adder", IEEE Trans. on Circuits and Systems 61-II(7): 521-525 (2014)

10 Manish Kumar Jaiswal, Ray C.C. Cheung, M. Balakrishnan and Kolin Paul, “Series Expansion based Efficient Architectures for Double Precision Floating Point Division", Journal of Circuits, Systems and Signal Processing. November 2014, Volume 33, Issue 11, pp 3499-3526.

9 Syed Mohammad Asad Hassan Jafri, Muhammad Adeel Tajammul, Kolin Paul, Ahmed Hemani, Juha Plosila and Hannu Tenhunen, “Private configuration environments (PCE) for efficient reconfiguration, in CGRAs", Springer Design and Automation of Embedded Systems, 2014.

8 Syed Mohammad Asad Hassan Jafri, Liang Guang, Ahmed Hemani, Juha Plosila, Kolin Paul and Hannu Tenhunen, “Energy-aware Fault-tolerant Network-on-chips for Addressing Multiple Traffic Classes", Microprocessors and Microsystems - Embedded Hardware Design 37(8-A): 811-822 (2013) *Number of citations:3*

7 Ashish Suri, Martin Bettag, Manjul Tripathi, Rama Chandra Deo, Tara Sankar Roy, Sanjeev Lalwani, Christoph Busert, Marcus Mehlitz, Payal Jotwani, Britty Baby, Vinkle Srivastav, Ramandeep Singh, Subodh Kumar, Prem Kalra, Subhashis Banerjee, Kolin Paul, Sanjiva Prasad, Bhawani Sharma. “Simulation in Neurosurgery in India- NETS" CNS Quarterly, Summer 2014

6 Tripathi M, Deo RC, Suri A, Srivastav V, Baby B, Kumar S, Kalra P, Banerjee S, Prasad S, Paul K, Roy TS, Lalwani S. "Quantitative Analysis of Kawase's Triangle versus Modified Dolenc Kawase Rhomboid Approach for Middle Cranial Fossa Lesions with Variable Antero-posterior

Extension". Journal of Neurosurg Jul 2015;123(1):14-22. doi: 10.3171/2015.2.JNS132876. Epub 2015 Apr 3.

5 Jotwani P, Srivastav V, Tripathi M, Deo RC, Baby B, Damodaran N, Singh R, Suri A, Bettag M, Roy TS, Busert C, Mehlitz M, Lalwani S, Garg K, Paul K, Prasad S, Banerjee S, Kalra P, Kumar S, Sharma BS, Mahapatra AK. "Free-access Open-source e-Learning in Comprehensive Neurosurgery Skills Training". Neurology India, Jul-Aug 2014 ;62(4):352-61. doi: 10.4103/0028-3886.141208.

4 Tapas Kumar Kundu, Kolin Paul, "Improving Android Performance and Energy Efficiency," Journal of Low Power Electronics 7(4): 516-528 (2011)

3 Rajeswari Devadoss, Kolin Paul, M. Balakrishnan: p-QCA: "A Tiled Programmable Fabric Architecture Using Molecular Quantum-Dot Cellular Automata", ACM Journal on Emerging Technologies in Computing Systems 7(3): 13 2011 *Number of citations:7*

2 R. Devadoss, K. Paul, and M. Balakrishnan. "Coplanar QCA crossovers", Electron. Letters 45, 1234 (2009) *Number of citations:10*

1 K. Paul, D. R. Chowdhury, and P. P. Chaudhuri, "Theory of Extended Linear Machines", IEEE Transactions on Computers, September 2002 *Number of citations:12*.

Journals (under Review)

1 Syed Mohammad Asad Hassan Jafri, Muhammad Adeel Tajammul, Peter Ellerve, Ahmed Hemani, Kolin Paul, Hannu Tenhunen and Juha Plosila, "Morphable Compression Architecture for Efficient Configuration in CGRAs", Microprocessors and Microsystems.

arXiv

5 Geeta Yadav, Kolin Paul: Architecture and Security of SCADA Systems: A Review. CoRR abs/2001.02925 (2020)

4 Xinhui Lai, Maksim Jenihhin, Georgios N. Selimis, Sven Goossens, Roel Maes, Kolin Paul: Early RTL Analysis for SCA Vulnerability in Fuzzy Extractors of Memory-Based PUF Enabled Devices. CoRR abs/2008.08409 (2020)

3 Xinhui Lai, Maksim Jenihhin, Jaan Raik, Kolin Paul: PASCAL: Timing SCA Resistant Design and Verification Flow. CoRR abs/2002.11108 (2020)

2 Sourav Das, Samuel Wedaj, Kolin Paul, Umesh Bellur, Vinay Joseph Ribeiro: Airmed: Efficient Self-Healing Network of Low-End Devices. CoRR abs/2004.12442 (2020)

1 Niladri Sekhar Tripathy, I. N. Kar, Kolin Paul, "Model Based Robust Control Law for Linear Event-triggered System", arXiv:1412.8365v1

Referred Conferences/Workshops

115 Vijay Kumar, Goldy, Kolin Paul, Mahesh Chowdhary: Long Short Term Memory (LSTM)-based Cuffless Continuous Blood Pressure Monitoring. VLSID 2024: 330-335

114 Avishek Choudhury, Brototi Mondal, Kolin Paul, Biplab K. Sikdar: LLC Block Reuse Predictor Design using Deep Learning to Mitigate Soft Error in Multicore. VLSID 2024: 690-695

113 Suyash Saxena, Varun Singh Negi, Kolin Paul: Compression of Large LSTM Networks for Inference on Space Constraint Systems. PReMI 2023: 137-146

112 Vijay Kumar, Vatsal Agrawal, Shorya Azad: Deep Learning Assisted Plus Disease Screening Retinal Image of Infants.In Proceedings of the 16th International Joint Conference on Biomedical Engineering Systems and Technologies - HEALTHINF, ISBN 978-989-758-631-6; ISSN 2184-4305, SciTePress, pages 538-545.

111 Vijay Kumar, Het Patel, Kolin Paul, Abhidnya Surve, Shorya Azad, Rohan Chawla: Improved Blood Vessels Segmentation of Retinal Image of Infants. HEALTHINF 2022: 142-153

110 Saurabh Tewari, Anshul Kumar, Kolin Paul: SACC: Split and Combine Approach to Reduce the Off-chip Memory Accesses of LSTM Accelerators. DATE 2022: 580-583

109 Vijay Kumar, Het Patel, Kolin Paul, Abhidnya Surve, Shorya Azad, Rohan Chawla: Deep Learning Assisted Retinopathy of Prematurity Screening Technique. HEALTHINF 2021: 234-243

108 Yu Yang, Ahmed Hemani, Kolin Paul: Scheduling Persistent and Fully Cooperative Instructions. DSD 2021: 229-237

107 Yu Yang, Ahmed Hemani, Kolin Paul: Scheduling Persistent and Fully Cooperative Instructions. FCCM 2021: 274

106 Vijay Kumar, Kolin Paul: DevFing: Robust LCR Based Device Fingerprinting. MECO 2021: 1-6

105 Geeta Yadav, Kolin Paul: Global Monitor using SpatioTemporally Correlated Local Monitors. NCA 2021: 1-10

104 Geeta Yadav, Kolin Paul, Alaa M. Allakany, Koji Okamura: IoT-PEN: A Penetration Testing Framework for IoT. ICOIN 2020: 196-201

103 B. Shanker Jaiswal, B. Chandra, Kolin Paul: Geodetic Distance and Dynamic Outlier Exclusion in EM Optimization of Self Exciting Point Process for Homicide Prediction in Chicago. IIAI-AAI 2020: 534-541

102 Saurabh Tewari, Anshul Kumar, Kolin Paul: "Bus Width Aware Off-Chip Memory Access Minimization for CNN Accelerators", ISVLSI 2020 ISVLSI 2020: 54-59

101 Ameer Shalabi, Kolin Paul, Tara Ghasempouri, Jaan Raik: "NV-SP: A New High Performance and Low Energy NVM-Based Scratch Pad", ISVLSI 2020 ISVLSI 2020: 240-245

100 Xinhui Lai, Maksim Jenihhin, Georgios N. Selimis, Sven Goossens, Roel Maes, Kolin Paul: Early RTL Analysis for SCA Vulnerability in Fuzzy Extractors of Memory-Based PUF Enabled Devices. VLSI-SOC 2020: 16-21

99 Alaa M. Allakany, Geeta Yadav, Kolin Paul, Koji Okamura: Detection and Mitigation of LFA Attack in SDN-IoT Network. AINA Workshops 2020: 1087-1096

98 Tara Ghasempouri, Jaan Raik, Kolin Paul, Cezar Reinbrecht, Said Hamdioui, Mottaqiallah Taouil: A Security Verification Template to Assess Cache Architecture Vulnerabilities. DDECS 2020: 1-6

97 Geeta Yadav, Kolin Paul, Alaa M. Allakany, Koji Okamura: IoT-PEN: A Penetration Testing Framework for IoT. ICOIN 2020: 196-201

96 Rajesh Kedia, M. Balakrishnan, Kolin Paul: A case for design space exploration of context-aware adaptive embedded systems: work-in-progress. CODES+ISSS 2019: 12:1-12:2

95 Rajesh Kedia, M. Balakrishnan, Kolin Paul: GRanDE: Graphical Representation and Design Space Exploration of Embedded Systems. DSD 2019: 4-12

94 Geeta, Kolin Paul: "PatchRank: Ordering updates for SCADA systems", 24th IEEE Conference on Emerging Technologies and Factory Automation 2019, Zargoza, Spain

93 Geeta Yadav, Kolin Paul: Assessment of SCADA System Vulnerabilities. ETFA 2019: 1737-1744

92 Geeta Yadav, Alaa M. Allakany, Vijay Kumar, Kolin Paul, Koji Okamura: Penetration Testing Framework for IoT. IIAI-AAI 2019: 477-482

91 Xinhui Lai, Maksim Jenihhin, Jaan Raik, Kolin Paul, "PASCAL: Timing SCA Resistant Design and Verification Flow" IOLTS2019, Greece

90 Dimitrios Stathis, Yu Yang, Saurabh Tewari, Ahmed Hemani, Kolin Paul, Manfred Grabherr and Rafi Ahmad, " Approximate Computing Applied to Bacterial Genome Identification using Self-Organizing Maps", ISVLSI2019

89 Rajeswari Devadoss, Kolin Paul, M Balakrishnan, "Majority Logic: Prime Implicants and n-Input Majority Term Equivalence", VLSID 2019

88 Sapna Sapna, N. S. Sreenivasalu, Kolin Paul:" DAPP: Accelerating Training of DNN". HPCC/SmartCity/DSS 2018: 867-872

87 Yu Yang, Dimmitrios Stathis, Prashant Sharma, Kolin Paul, Ahmed Hemani, Manfred Grabherr, Rafi Ahmad: RiBoSOM: rapid bacterial genome identification using self-organizing map implemented on the synchoros SiLago platform. SAMOS 2018: 105-114

86 Varan Gupta, Rohit Patel, Gaurav Sardal, Jyotirmoy Ray, S. K. Saha, Kolin Paul: Design and Development of Robots for ABU Robocon 2016. AIR 2017: 13:1-13:6

85 Syed Mohammad Asad Hassan Jafri, Ahmed Hemani, Kolin Paul, Naeem Abbas , "MOCHA: Morphable Locality and Compression Aware Architecture for Convolutional Neural Networks". IPDPS 2017: 276-286

84 Chinmaya Dash, Kolin Paul and D Roy Chowdhury, "AES in Partially Reconfigurable CGRAs", TENCON 2016, Singapore

83 Naman Agarwal and Kolin Paul, "XEBRA: XEN Based Remote Attestation", TENCON 2016, Singapore.

82 Shalini Singh , Kolin Paul, Geeta and Sanjiva Prasad, “prasavGraph: Android based Labor Monitoring" HEALTHINF 2016 Rome, Italy.

81 Kolin Paul and Vijay Kumar, “ mNetra: Fundus Imaging based Retinoscopy", HEALTHINF 2016 Rome, Italy.

80 Kolin Paul, Abdul Khalid, Yasoob Haider, Shalini Singh and Sanjiva Prasad, “prasavGraph: an Android-based e-Partograph", ICSMB India, 2016

79 Pei Liu, Kolin Paul, Ahmed Hemani, “3D-stacked Many-Core Architecture for Biological Sequence Analysis Problems", SAMOS 2015.

78 Rajeswari Devadoss, Kolin Paul and M Balakrishnan, “An n-input Majority Algebra based Logic Synthesis Tool for Quantum-dot Cellular Automata", 25th International Workshop on Logic & Synthesis Austin, USA 2015.

77 Mansureh S, Kolin Paul M Balakrishnan,“Partial Reconfiguration for Dynamic Mapping of Task Graphs onto 2D Mesh Platform" 11th International Symposium on Applied Reconfigurable Computing Bochum, Germany 2015

76 Kolin Paul and Vijay Kumar, “ Fundus Imaging Based Affordable Eye Care", HEALTHINF 2014

75 Niladri Tripathi, I N Kar and Kolin Paul, “A Model Based Robust Control Law for Linear Event-triggered System", INDICON, Pune 2014

74 Niladri Tripathi, I N Kar and Kolin Paul, “An Event-triggered Based Robust Control of Robot Manipulator", ICARCV 2014 Singapore.

73 Rajesh Kumar Pal, Kolin Paul and Sanjiva Prasad, “Energy Efficient Dynamic Core Allocation for Video Decoding in Embedded Multicore Architectures", IEEE ICESS- 2014.

72 Sharat Chandra Varma Bogaraju, Kolin Paul and M Balakrishnan, “High Level Design Approach to Accelerate De Novo Genome Assembly using FPGAs", EUROMICRO DSD 2014, Italy.

71 Syed Mohammad Asad Hassan Jafri, Muhammad Adeel Tajammul, Peter Ellerve, Ahmed Hemani, Kolin Paul, Hannu Tenhunen and Juha Plosila, “Morphable Compression Architecture for Efficient Configuration in CGRAs", EUROMICRO DSD 2014, Italy.

70 Syed Mohammad Asad Hassan Jafri, Masoud Daneshtalab, Kolin Paul, Ahmed Hemani, Hannu Tenhunen, Guillerno Serreno and Naeem Abbas “TransPar: Transformation Based Dynamic Parallelism for Low Power CGRAs", FPL 2014

69 Manish Kumar Jaiswal, Ray C.C. Cheung, M. Balakrishnan and Kolin Paul, “Configurable Architecture for Double / Two-Parallel Single Precision Floating Point Division", ISVLSI 2014

68 Syed Mohammad Asad Hassan Jafri, Guilermo Serrano, Junaid Iqbal, Masoud Daneshtalab, Ahmed Hemani, Kolin Paul, Juha Plosila and Hannu Tenhunen, “RuRot: Run-time Rotatable-expandable Partitions for Efficient Mapping in CGRAs" SAMOS 2014

67 B. Sharat Chandra Varma, Kolin Paul, M. Balakrishnan, “High Level Design Approach to Accelerate De Novo Genome Assembly using FPGAs", ASAP 2014 (accepted but withdrawn for logistical reasons)

66 Mansureh S, Kolin Paul M Balakrishnan“Mapping Tasks to a Dynamically Reconfigurable Coarse Grained Array" FCCM Toronto 2014

65 Syed Mohammad Asad Hassan Jafri, Kolin Paul, Masoud Daneshtalab, Ahmed Hemani, Juha Plosila,and Hannu Tenhunen“Morphable compression architecture for efficient configuration in CGRAs" FCCM Toronto 2014

64 Avval Gupta, Anjua Kansal, Kolin Paul and Sanjiva Prasad, “mDROID - An Affordable Android based mHealth System", HEALTHINF 2014

63 Kolin Paul and Chinmaya Dash, “A Reconfigurable MultiProcessor Framework with A Fast Overlay Network", VLSI Design 2014

62 B. Sharat Chandra Varma, Kolin Paul, M. Balakrishnan, “Accelerating Genome Assembly using Hard Embedded Blocks in FPGAs", VLSI Design 2014

61 Syed M. A. H. Jafri and Stanislaw J. Piestra and Ahmed Hemani and Kolin paul and Juha Plosila and Hannu Tenhunen, “Implementation and evaluation of configuration scrubbing on CGRAs: A case study", International Symposium on System-on-Chip, Finland 2013

60 Ashutosh Jain, Anshuj Garg and Kolin Paul, “GAGM: Genome Assembly on GPU using Mate pairs", 20th Annual International Conference on High Performance Computing (HiPC 2013), Bangalore 2013

59 Anshuj Garg, Ashutosh Jain and Kolin Paul, “GGAKE: GPU based Genome Assembly using K-mer Extension", 15th IEEE International Conference on High Performance Computing and Communications (HPCC 2013), Zhangjiajie, China, November 13-15, 2013

58 Nasim Farhani, Kolin Paul and Ahmed Hemani, “Distributed Runtime Computation of Constraints for Multiple Inner Loops", EUROMICRO DSD 2013 Spain

57 SMAH Jafri, O Bag, A Hemani, N Farahini, Kolin Paul, J Plosila, H Tenhunen, “Energy-aware coarse-grained reconfigurable architectures using dynamically reconfigurable isolation cells",4th International Symposium on Quality Electronic Design (ISQED), 2013.*Number of citations:15*

56 Syed Mohammad Asad Hassan Jafri, Liang Guang, Ahmed Hemani, Juha Plosila, Kolin Paul and Hannu Tenhunen, “Energy-Aware Fault-Tolerant CGRAs Addressing Application with Different Reliability Needs",EUROMICRO DSD 2013 Spain.

55 B. Sharat Chandra Varma, Kolin Paul, M. Balakrishnan and Dominique Lavenier, “ FAssem : FPGA based Acceleration of De Novo Genome Assembly" FCCM 2013 Washington USA.*Number of citations:7*

54 Mansureh S, Kolin Paul M Balakrishnan: Design and Implementation of High Performance Architectures with Partially Reconfigurable CGRAs RAW 2013 Boston.

53 Nidhi U, Kolin Paul, Anshul Kumar Ahmed Hemani: High Performance 3D-FFT Implementation. ISCAS 2013 Beijing

52 Syed Mohammad Asad Hassan Jafri, Liang Guang, Ahmed Hemani, Juha Plosila, Kolin Paul and Hannu Tenhunen, “Energy-Aware-Task-Parallelism for Efficient Dynamic Voltage, and Frequency Scaling, in CGRAs", SAMOS XIII 2013 Greece.*Number of citations:13*

51 B. Sharat Chandra Varma, Kolin Paul, M. Balakrishnan: Accelerating 3D-FFT Using Hard Embedded Blocks in FPGAs. VLSI Design 2013: 92-97

50 Aarathi Prasad, Ronald A. Peterson, Shrirang Mare, Jacob Sorber, Kolin Paul, David Kotz: Provenance framework for mHealth. COMSNETS 2013: 1-6 *Number of citations:9*

49 Syed Mohammad Asad Hassan Jafri, Liang Guang, Ahmed Hemani, Juha Plosila, Kolin Paul and Hannu Tenhunen, "Energy-aware Fault-tolerant Network-on-chips for Addressing Multiple Traffic Classes", EUROMICRO DSD 2012 Turkey.

48 Kolin Paul, Chinmaya Dash and Mansureh Moghaddam, "reMORPH – A Runtime Reconfigurable Architecture", EUROMICRO DSD 2012, Turkey.*Number of citations:4*

47 Rajesh Kumar Pal, Kolin Paul, Sanjiva Prasad, "ReKonf: A Reconfigurable Adaptive ManyCore Architecture", Parallel and Distributed Processing with Applications (ISPA), 2012 IEEE 10th International Symposium on , vol., no., pp.182-191, 10-13 July 2012 *Number of citations:4*

46 Arun Parakh, M. Balakrishnan, Kolin Paul,"Performance estimation for GPUs with cache", Parallel and Distributed Processing Symposium Workshops & PhD Forum (IPDPSW), 2012 IEEE 26th International , vol., no., pp.2384-2393, 21-25 May 2012 *Number of citations:12*

45 Pei Liu, Kolin Paul, Ahmed Hemani, "Improved Bioinformatics Processing Unit for Multiple Applications", (Parallel and Distributed Processing Symposium Workshops & PhD Forum (RAW), 2012 IEEE 26th International , vol., no., pp.390-396, 21-25 May 2012 *Number of citations:3*

44 Mohammad Asad, Liang Guang, Axel Jantsch, Kolin Paul, Ahmed Hemani, Hannu Tenhunen, "Self-Adaptive NOC Power Management With Dual-Level Agents: Architecture and Implementation", SANES (PECCS) 2012, Italy. *Number of citations:5*

43 Rajeswari Devadoss, Kolin Paul, M. Balakrishnan,"Architecture and tools for programmable QCA", FPT 2011 Delhi

42 Syed. M.A.H. Jafri, Ahmed Hemani, Kolin Paul, Juha Plosila, Hannu Tenhunen, "Compact Generic Intermediate representation (CGIR) to enable late binding in Coarse Grained Reconfigurable Architectures", FPT2011 Delhi *Number of citations:22*.

41 Pei Liu, Fatemeh O. Ebrahim, Kolin Paul and Ahmed Hemani, "A Coarse-Grained Reconfigurable Processor for Sequencing and Phylogenetic Algorithms in Bioinformatics", ReConFig 2011 Cancun.

40 Tapas Kumar Kundu, Kolin Paul, "Improving Android Performance and Energy Efficiency," pp.256-261, 2011 24th International Conference on VLSI Design, 2011 *Number of citations:7*

39 Pei Liu, Ahmed Hemani, Kolin Paul, "A Reconfigurable Processor for Phylogenetic Inference," pp.226-231, 2011 24th International Conference on VLSI Design, 2011

38 Syed. M.A.H. Jafri, Ahmed Hemani, Kolin Paul, Juha Plosila, Hannu Tenhunen, "Compression Based Efficient and Agile Configuration Mechanism for Coarse Grained Reconfigurable Architectures," pp.290-293, 2011 IEEE International Symposium on Parallel and Distributed Processing Workshops, 2011 *Number of citations:14*

37 Kolin Paul, Tapas Kumar Kundu, "Android on Mobile Devices: An Energy Perspective", CIT 2010: 2421-2426 *Number of citations:87*

36 Sohan Lal, Kolin Paul and James Gomes, “Accelerating Metabolic Pathways Simulation using GPUs", ADPC 2010.

35 Rajeswari Devadoss, Kolin Paul, M. Balakrishnan: A tiled programmable fabric using QCA. FPT 2010: 9-16

34 A High-Level Synthesis Flow for Custom Instruction Set Extensions for Application Specific Processors. Nagaraju P, P Brisk, P Ienne, A Kumar and Kolin Paul, ASPDAC 2010. *Number of citations:20*.

33 Clocking-based Coplanar Wire Crossing Scheme for QCA. Rajeswari D, Kolin Paul, M Balakrishnan. VLSID 2010 *Number of citations:12*.

32 Kolin Paul and Tapas Kundu. Android on Mobile Devices: An Energy Perspective. V International Symposium on Advanced Topics on Embedded Systems and Applications. Bradford, UK, 29 June - 1 July, 2010

31 Rohan Paul, Ankush Garg, Vaibhav Singh, Dheeraj Mehra, M. Balakrishnan, Kolin Paul, Dipendra Manocha. Smart Cane for the Visually Impaired: Design, Implementation and Field Tesing of an affordable Obstacle Detection System. TRANSED 2010(Best Paper) *Number of citations:5*.

30 Rohan Paul, Ankush Garg, Vaibhav Singh, Dheeraj Mehra, M. Balakrishnan, Kolin Paul, Dipendra Manocha. User Triggered Bus Identification and Homing System: Making public transport accessible for the Visually Challenged. TRANSED 2010.

29 Reliable Context Detection for Improving Positioning Performance and Enhancing user Experience. M. Chowdhary, M. Chansarkar, M. Sharma, A. Kumar, K. Paul, M. Jain, C. Agarwal and G. Narula, ION GNSS 2009 Conference *Number of citations:5*

28 Rajeswari D, Kolin Paul and M Balakrishnan. Clocking-based Coplanar Wire Crossing Scheme for QCA. International Workshop on Quantum-Dot Cellular Automata 2009

27 A Jain and P Gambhir and P Gupta and M Balakrishnan and K. Paul, "FPGA Accelerator for Protein Structure Prediction Algorithms" SPL 2009 *Number of citations:14*.

26 Nagaraju P, Anshul Kumar and Kolin Paul. A Novel Approach to Compute Spatial Reuse in the Design of Custom Instructions. VLSID 2008. Hyderabad January, 2008.

25 Nagaraju P, Anshul Kumar and Kolin Paul. Exhaustive Enumeration of Legal Custom Instructions for Extensible Processors VLSID 2008. Hyderabad January, 2008 *Number of citations:9*.

24 Neeraj Goel and Kolin Paul. Hardware Controlled and Software Independent Fault Tolerant FPGA Architecture ADCOM 2007 Guwahati.

23 Kolin Paul Joel Porquet. Silicon Compaction/Defragmentation for Partial Runtime Reconfiguration. EUROMICRO Conference of Digital Systems Design 2007. August 27-31 2007. Lubeck Germany.

22 M. Balakrishnan, Kolin Paul, Rohan Paul, Ankush Garg, Vaibhav Singh, Dheeraj Mehra, Dipendra Manocha. PVM Rao, V Singh, V Goel, D Mukherjee. Cane Mounted Knee Above Obstacle Detection and Warning System for the Visually Impaired. 3^{rd} ASME/IEEE Conference on Mechatronics and Embedded Systems and Applications ASME-DETC 2007. September 4-7 2007, Las Vegas.

21 Nagaraju Pothineni Anshul Kumar Kolin Paul. Recurring Pattern Identification and its Application to Instruction Set Extension. The 2007 International Conference on Computer Design (ICCD) Las Vegas, Nevada, USA (June 25-28) 2007.

20 Rohan Paul, Ankush Garg, Vaibhav Singh, Dheeraj Mehra, M. Balakrishnan, Kolin Paul, Dipendra Manocha. "'Smart' Cane for the Visually Impaired:Technological Solutions for Detecting Waist-above Obstacles" TRANSED 2007 Montreal Canada June 2007

19 Nagaraju Pothineni Anshul Kumar Kolin Paul, "Application Specific Datapath Extension with Distributed I/O Functional Units", VLSID 2007. Bangalore January, 2007 *Number of citations:37*.

18 Kolin Paul M Balakrishnan. "Experiences of a Summer Workshop in Embedded Systems", Workshop on Embedded System Education, EMSOFT, South Korea . October, 2006.

17 Nilesh Padhariya, Kolin Paul and Dheeraj Bhardwaj. " A FLOPS Based Model for Performance Analysis and Scheduling of Applications for Single and Multiple CPUs", ICPP Workshops 2006.

16 Neeraj Goel and Kolin Paul. "Fault Tolerant FPGA using Redundant Columns", Proc of VLSI Design and Test Symposium(VDAT 2006), Goa, India.. July, 2006.

15 Rahul Jain, Anindita Mukherjee and Kolin Paul, "Defect-Aware Design Paradigm for Reconfigurable Architectures", IEEE Computer Society Annual IEEE Computer Society Annual Symposium on VLSI (ISVLSI 2006). April, 2006 *Number of citations:24*.

14 H. Dhand, and N.Goel and M.Agarwal, H. Dhand, N.Goel, M.Agarwal and K.Paul, "Partial and Dynamic Reconfiguration in Xilinx FPGAs —- A Quantitative Study", VDAT 2005. August, 2005.

13 Sanjay Rajopadhye and Kolin Paul, "A 1.5-D Architecture for Back Propagation Training ", Engineering Of Reconfigurable Systems and Algorithms (ERSA'05) . June, 2005.

12 Clare Hugget and Koushik Maharatna and Kolin Paul, "On the Implementation of 128-bit FFT/IFFT for High Performance WPAN", 2005 IEEE International Symposium 2005 IEEE International Symposium on Circuits and Systems. May, 2005 *Number of citations:5*.

11 Kolin Paul, "An FPGA based Test Bed for Bio Inspired Computation", 12th Reconfigurable Architectures Workshop RAW 2005, Denver. April, 2005.

10 K Paul and S Rajopadhye , "A New Hardware/FPGA Implementation of the Back Propagation Algorithm" IEEE Annual Symposium on VLSI 2003

9 P. P. Chaudhuri, B. Sikdar, and K. Paul, "Tutorial on Theory and Application of Cellular Automata CA for VLSI Design and Test", in VLSID'00 INDIA, January 2000.*Number of citations:21*.

8 K. Paul, D. R. Chowdhury, and P. P. Chaudhuri, "Scalable Pipelined Micro-Architecture for Wavelet Transform", in Proc. of VLSID'00, INDIA, January 2000.

7 K. Paul and D. R. Chowdhury, "Application of GF(2^p) CA in Burst Error Correcting Codes", in Proc. of VLSID'00, INDIA, January 2000 *Number of citations:16*.

6 K. Paul, S. P. Chaudhuri, R. Ghosal, B. Sikdar, and D. R. Chowdhury, "GF(2^p) CA Based Vector Quantization for Fast Encoding of Still Images", in Proc. of VLSID'00 INDIA, January 2000. *Number of citations:4*

5 B. Sikdar, K. Paul, G. P. Biswas, C. Yang, V. Bopanna, S. Mukherjee, and P. P. Chaudhuri, "Theory and Application of GF(2^p) Cellular Automata as On-Chip Test Pattern Generator", in Proc. of VLSI'00 INDIA, January 2000 *Number of citations:19*.

4 K. Paul, D. R. Chowdhury, and P. P. Chaudhuri, "Cellular Automata Based Transform Coding for Image Compression", in Proc. of HiPC'99 INDIA, December 1999 *Number of citations:9*.

3 K. Paul, P. Dutta, D. R. Chowdhury, P. K. Nandi, and P. P. Chaudhuri, "A VLSI Architecture for On-Line Image Decompression using GF(2^p) Cellular Automata", in Proc. of VLSID'99 INDIA, January 1999.

2 K. Paul, A. Roy, P. K. Nandi, B. N. Roy, M. D. Purkhayastha, S. Chattopadhyay, and P. P. Chaudhuri, "Theory and Application of Multiple Attractor Cellular Automata for Fault Diagnosis", in Proc. of ATS'97 Singapore, December 1997 *Number of citations:14*.

1 K. Paul, D. R. Chowdhury, and P. P. Chaudhuri, "A Parallel Architecture for Generation of Fractals", in Proc. of ADCOM'97 INDIA, January 1997.

Patents

- Cuffless Blood Pressure Monitor With Multiple Inertial Measurement Units
  Status: U.S. Patent Appl. No. 18/063,021, Filed: December 7, 2022
- Smart Cane – This is a device for helping visually challenged persons to navigate independently.
  Status: Provisional patent granted
- Bus Identification Module – This is a two way system which helps a visually challenged person to identify, orient and board a (public transport) bus. The solution is also customizable to build navigational aids for such persons inside buildings.
  Status: Provisional patent granted
- Methods and applications for altitude measurement and fusion of user context detection with elevation motion for personal navigation systems
  Status: US Patent :US8566032 B2
- Methods and applications for motion mode detection for personal navigation systems
  Status: US Patent :US 20110029277 A1
- Neuro-endoscope box trainer
  Status: US Patent : US 20170316720 A1
- Neuro-drill-stencil trainer
  Status: US Patent : US 20170330485 A1

Student Supervision

PhD

Graduated

1 *Nagaraju P* : An Automation Methodology for Building Application Specific Processor Architectures and Compilers, July 2009 . Co Supervisor: Anshul Kumar Current Affiliation: Google Labs.

2 *Sarat Chandran Varma* : A Methodology for embedding Hard IPs Jan 2015 Co Supervisor M Balakrishnan Current Affiliation: Hongkong City University

3 *Rajesh K Pal* :reKonf: Dynamically Reconfigurable Multicore Architecture, Sept 2015]. Co Supervisor Sanjiva Prasad Current Affiliation: Indian Air Force

4 *Mansureh Shahraki Moghaddam* : Application Mapping onto Reconfigurable Coarse Grained Arrays, September 2015 Co Supervisor M Balakrishnan Current Affiliation: Seokyeong University South Korea

5 *Rajeswari Devadoss* : Novel Architectures and Synthesis methods for quantum-dot cellular automata December 2015 Co Supervisor M Balakrishnan Current Affiliation: PostDoc at NTU Singapore

6 *Arun Parakh* : Performance Estimation for GPU Based Architectures 2016 . Co Supervisor M Balakrishnan Current Affiliation: Assistant Professor GGSIP Indore

7 *Niladri Shekhar Roy* : Cooperative Control for Multiple Mobile Robots 2017 Co Supervisor I N Kar

8 *Rajesh Kedia* :Context Aware Synthesis Frameworks 2020 Co Supervisor M Balakrishnan

9 *Samuel Wadej* : Hardware Assisted Security for IoT 2021 Co Supervisor Vinay Ribeiro

10 *Geeta* :Security for SCADA and Industrial Systems 2022

11 *Saurabh Tiwari* : Optimizing Neural Networks Performance on Parallel Architectures 2024 Co Supervisor Anshul Kumar

12 *Vijay Kumar* : Scalable, Low-cost, Fast Screning of Retinopathy of Prematurity ()ROP) 2024

13 Cosupervised the work of two students studying at KTH

   1 Syed Mohammad Asad Hassan Jafri 2013

   2 Liu Pei 2015

OnGoing

1 *Priyanka Chauhan* : [Started Jan 2020] Screening Devices for Cardiac Problems

Masters

1 *Ashutosh Jain* : Accelerating NGS using Heterogeneous Platforms (GPU + FPGA + MultiCore)

2 *Anshuj Garg* : Accelerating deNovo Assembly using Heterogeneous Platforms (GPU+FPGA+MultiCore)

3 *Peeyush Srivastava* : Virtualization Support for embedded Platforms

4 *Simi Suny*:Cooperative Exploration using Mobile Robots

5 *Anshu Agarwal*: Distributed Collective Localization and Sensor Fusion

6 *Kapil Suri*: Study of Algorithms for Distributive Video Coding

7 *Tapas Kundu* :Performance Characterizations for microkernel based mobile platforms

8 *Asish Srivastava* : Security Solutions for microkernel based mobile platforms

9 *Puneet Kapoor* : Out of Core Linear Algebra Kernels on GPUs

10 *Amol Gupta* : Pedestrian Dead Reckoning Systems

11 *Rohan Paul* : Smart Cane — Augmenting the white Cane for the Visually Challenged, June 2008.

12 *Vaibhav* : Assisting Independent Mobility of the Visually Challenged in Public Transfort Systems, June 2008.

13 *Dheeraj Mehra* : Assisting Independent Mobility of the Visually Challenged in Public Utility Buildings, June 2008.

14 *Sunil Shah* : A Framework (Semantics) to describe and implement partial Runtime Reconfiguration, June 2009.

15 *Arun S Nair* : Modelling and Specification of partial Runtime Reconfigurable Systems, June 2008.

16 *Rohit Prakash* : Framework for Codesign of Scientific Applications using Clusters augmented with FPGAs, June 2008

17 *Lalit Kumar Bansal* : Design and Implementation of a Digital Processor for Shack Hartmaan Wavefront Sensor System, June 2007.

18 *Tejpal Verma* : Automatic Wrapper Generation of custom IPs for Platform FPGAs, June 2007.

19 *Rajiv Roy* : Parallel Event-Driven HDL Simulation on Multicore a MultiProcessor Architectures, June 2007.

20 *G Rakesh* : Vision Based Mobile Landmark Localization using Artificial Landmarks, May 2007.

21 *Somen Barma* : Design, Development and Performance evaluation of MultiProcessor Systems on FPGA.

22 *Uday Kiran P* :Optimal Path Planning for Mobile Robots, May 2007.

23 *Nikunj Shroff* : Memory Hierarchy for MicroBlaze and PowerPC based Systems, May 2007.

24 *Mayank Ahuja* : Shared Memory MultiProcessor Embedded System on FPGA, December 2006.

25 *Ratnesh Kumar* : Design and Implementation of a Digital Processor for Target Tracking, May 2006.

26 *Nilesh Padharia* : A FLOPS based Model for Performance Analysis and Scheduling Applications fo Single and Multiple CPUs, May 2006.

27 *Pratibha Sharma* : SystemC Modelling — Configuring Philips AThereal NoC using ARM, July 2005.

Masters by Research Thesis

5 *Goldy* : Long Short Term Memory and Transfer Learning based Blood Pressure Estimation

4 *Vijay Kumar* : Mobile Phone Based Screening Aids for the Eye

3 *Ierum Shanaya* : Opportunistic Compute Architectures

2 *Chinmaya Dash* : Compilation system for ReMorph

1 *Sohan Lal* : A Methodology for Accelerating Metabolic Networks Simulation using GPUs

Funding

SponsoredProjects

Total Value in **INR** : 35 Cr [IRD Data]

All *Amounts* in **INR** unless specified otherwise

As Principal Investigator (PI

16 Social Media Analytics for Security (SMACS)
Sponsor: NSCS
Start Date: March 2018, End Date: Feb 2020
Amount 8,13,00,000.

15 ADROP: Automated Detection of Retinopathy of Prematurity and Quantification of Plus Disease (Under MFIRP Scheme of IRD with AIIMS)
Sponsor: IITD+AIIMS
Start Date: April 2020, End Date: Mar 2022
Amount 10,00,000

14 AMR-Diag: A novel diagnostic tool for Sequence based Prediction of Antimicrobial Resistance
Sponsor: ICMR
Start Date: March 2018, End Date: Feb 2020
Amount 54,00,000 .

13 SwayamPrabha
Sponsor: MHRD

Start Date: Sept 2016, End Date: Aug 2018
Amount 1,60,00,000.

12 Design and Development of Retinal Image Based wireless Sensor Module for affordable Mobile Health-Care,
Sponsor: ,"Telecommunications Consultants India Ltd.India",
Start Date,03-05-2012,End Date:,31-08-2014,
Amount: 1500000.00,

11 Mobile Opthalmoscope (TDP-IAS 2011 - II),,"Industrial Research & Development, IIT Delhi.India",
Start Date,23-11-2011,End Date:,22-05-2012,
Amount: 31000.00,

10 Intel Grant of 20 Atom Boards for setting up an embedded curriculum at IIT Delhi.

9 Intel Semiconductors (US) Ltd. Research Award Grant to Prof./Dr. Kolin Paul (Donation grant),,"Intel Corp.United States of America",
Start Date,29-10-2011,End Date:,31-12-2015,
Amount: 490000.00,

8 Ultra Low Power Fabric for Reconfigurable Processors,,"Department of Science & Technology (DST)India",
Start Date,11-10-2011,End Date:,10-10-2015,
Amount: 3527200.00,

7 "Reconfigurable Computing High Level Specification, Modeling and Synthesis of Run-Time Reconfigurable Systems",,"European Aeronautic Defence & Space CompanyFrance",
Start Date,19-09-2007,End Date:,30-09-2011,
Amount: 3389225.00,

6 FPGA Implementation of Signal Processing Algorithms for IRST,,"Instruments Research & Development Establishment India",
Start Date,22-04-2005,End Date:,30-09-2006,
Amount: 699637.00,

5 Operating System Support for Hardware DLLs,,"Industrial Research & Development, IIT Delhi.India",
Start Date,16-07-2004,End Date:,31-08-2006,
Amount: 100000.00,

4 Sun Asia Pacific Science and Technology Facility (APSTF) at Deptt. of Computer Science & Engineering at IIT Delhi,,"Sun Microsystems Inc.Singapore",
Start Date,01-01-2004,End Date:,31-12-2005,

Amount: 276000.00,

3 Title: Summer Workshop on Digital Hardware Design
Duration: June, 2005 to July, 2005
Sponsor(s): Xilinx Inc
Budget: Rs 3,20,000

2 Summer Workshop on Digital Design 2006
Duration: June, 2006 to July, 2006
Sponsor(s): Xilinx Inc and CMC Ltd
Budget: Rs 3,60,000

1 Summer Workshop on Digital Design 2007
Duration: June, 2007 to July, 2006
Sponsor(s): Xilinx Inc and CMC Ltd
Budget: Rs 3,60,000

As CoPI

22 Design and fabrication of all conventional transistor based neuromorphic chip for real time bio-informatics application (Under MFIRP scheme of IRD) Sponsor: IITD
Start Date: Dec 2019, End Date: Nov 2021
Amount 10,00,000

21 Development of Mobile/Smart Partograph (ICMR Task Force Study),
Sponsoring Agency:,"Indian Council of Medical ResearchIndia",
Start Date:,06-04-2015, Completion Date:,05-04-2016,
Sanctioned Funds:Rs 675950.00,

20 National Programme on Perception Engineering- (NPPE) Phase II,
Sponsoring Agency:,"Ministry of Communications & Information TechnologIndia",
Start Date:,28-03-2014, Completion Date:,27-03-2018,
Sanctioned Funds:Rs 26082000.00,

19 Design & Development of Electronic Personal Security Device,
Sponsoring Agency:,"Ministry of Communications & Information TechnologIndia",
Start Date:,01-08-2013, Completion Date:,31-03-2015,
Sanctioned Funds:Rs 4800000.00,

18 "Centre for Excellence in Low Power Design on Nanoscale Devices, Circuits and Systems",
Sponsoring Agency:,"Ministry of Human Resource DevelopmentIndia",
Start Date:,08-05-2013, Completion Date:,07-05-2017,
Sanctioned Funds: Rs 10000000.00,

17 Foundations for Trusted and Scalable 'Last Mile' Healthcare,
Sponsoring Agency:,"Department of Electronics& Information TechnologyIndia",
Start Date:,15-04-2012, Completion Date:,31-03-2015,
Sanctioned Funds:Rs 11040000.00,

16 Advanced Information System Security Laboratory (Phase - II),
Sponsoring Agency:,"National Technical Research Organization (NTRO)India",
Start Date:,15-04-2012, Completion Date:,14-04-2014,
Sanctioned Funds:Rs 12240948.00,

15 Visit and Interaction with Electrical & Computer Engineering Students and Faculty Phase-II of (CW11800),
Sponsoring Agency:,"Addis Ababa University, EthiopiaIndia",
Start Date:,07-06-2011, Completion Date:,30-11-2012,
Sanctioned Funds:Rs 4582770.00,

14 Coarse Grain Reconfigurable Embedded Systems Technology,
Sponsoring Agency:,"International Division, Dept. of Science & Techn.Sweden",
Start Date:,05-04-2011, Completion Date:,04-04-2014,
Sanctioned Funds:Rs 3741760.00,

13 Production and Field Trials of the "Smart" Cane for the Visually Challenged (An affordable knee-above obstacle detection and warning system for the visually impaired)
Duration - March 2011-Feb-2013
Sponsor: Wellcome Trust
Budget: GBP 360,000

12 Characterization of Multi-core Processors for Power-Estimation at System-Level (CoMPESys).,
Sponsoring Agency:,"International Division, Dept. of Science & Techn.Germany",
Start Date:,08-10-2010, Completion Date:,07-10-2013,
Sanctioned Funds: Rs 1552400.00,

11 Development of Coordinated Multi WMR Systems(Sub project # 2 under the main project # RP02346),
Sponsoring Agency:,"Board of Research in Nuclear Sciences (DAE)India",
Start Date:,04-05-2010, Completion Date:,31-12-2015,
Sanctioned Funds: Rs 14818000.00,

10 Developing 'Camera' as a Sensor to Act as an External Aid for Inertial Navigation Systemn (INS) (TDP-IAS 2009 (II)),
Sponsoring Agency:,"Industrial Research & Development, IIT Delhi.India",
Start Date:,04-11-2009, Completion Date:,31-12-2010,

Sanctioned Funds:Rs 50000.00,

9 Design & Development of a Rapidly Deployable Wimaxwireless Mesh Network,
Sponsoring Agency:,"Ministry of Communication & Information TechnologyIndia",
Start Date:,24-12-2008, Completion Date:,31-05-2012,
Sanctioned Funds:Rs 9792000.00,

8 "Visit and Interaction between Electrical & Computer Engineering Students and Faculty at Addis Ababa University, Ethiopia (PHASE-I)",
Sponsoring Agency:,"Addis Ababa University, Ethiopia Ethiopia",
Start Date:,01-12-2008, Completion Date:,30-11-2012,
Sanctioned Funds:Rs 3576924.00,

7 Large Scale Data Processing and Visualisation,
Sponsoring Agency:,"Naval Research Board, Ministry of DefenceIndia",
Start Date:,04-11-2008, Completion Date:,30-09-2011,
Sanctioned Funds:rs 3974100.00,

6 Intelligent Sensor Data Fusion for Indoor Positioning,
Sponsoring Agency:,"SIRF TechnologyIndia",
Start Date:,01-08-2008, Completion Date:,31-05-2013,
Sanctioned Funds:Rs 4607700.00,

5 System Level Modeling and Virtual Prototyping,
Sponsoring Agency:,"NXP Semiconductors India Pvt. Ltd.India",
Start Date:,26-11-2007, Completion Date:,25-11-2010,
Sanctioned Funds: Rs 3130000.00,

4 A Framework for CoDesign Solutions for High Performance Scientific Applications,
Sponsoring Agency:,"European Aeronautic Defence & Space CompanyFrance",
Start Date:,19-09-2007, Completion Date:,30-09-2011,
Sanctioned Funds:Rs 3389225.00,

3 The Smart Cane Project (TDP-IAS 2006),
Sponsoring Agency:,"Industrial Research & Development, IIT Delhi.India",
Start Date:,05-01-2007, Completion Date:,04-09-2007,
Sanctioned Funds:Rs 50000.00,

2 The Smart Cane Project,
Sponsoring Agency:,"Media Lab AsiaIndia",
Start Date:,27-10-2006, Completion Date:,31-12-2008,

Sanctioned Funds:Rs 700000.00,

1 Design and Prototyping of a FPGA based Digital Processor for Shack Hartmann Wevefront Sensor,
Sponsoring Agency:,"Instruments Research & Development EstablishmentIndia",
Start Date:,05-09-2005, Completion Date:,15-12-2008,
Sanctioned Funds:Rs 3505200.00,

Consulting Projects

5 HIEICODE - HIErarchical Information Processing for COntext DEtection
Duration: May 20- Apr 21
Sponsor: ST Micro Switzerland
Budget : US$26928

4 Advise on Electronic Fencing in International Border
Duration: Sept 16- Oct 16
Sponsor: Samsung Research India
Budget : INR 8,00,000
CoPI: Ranjan Bose, Arun Kumar

3 Multimedia on Configurable Arrays
Duration: Jan-2015-Dec-2015
Sponsor: Samsung Research India
Budget : INR 15,00,000
CoPI: Anshul Kumar

2 Development of Signal Processor for IRST
Duration: November, 2004 to September, 2005
Sponsor(s): IRDE
Budget: Rs 7,71000
CoPI: M Balakrishnan

1 Consultant for Kritikal Solutions
Duration: March 2005 - Oct 2005
Sponsor(s): Kritikal Solutions
Budget: Rs 1,00,00

Build up of, participation and cooperation in international networks.
Co-PI in a Indo-Norway project
Co-PI in a Indo-US DST-NSF project
Co-PI in a Indo-Sweden DST-VINNOVA project

Service

Member of Program Committees of Conferences

1 Program Committee Member, MES 2013, 2014, 2015, 2016

2 Program Committee Member, SAMOS 2016

3 Program Committee Member, FPGAWorld 2015

4 Track Chair (FPGA and Digital Design), VLSI Design 2015

5 Program Committee Member, FPGAWorld 2013, 2014, 2015

6 Organizing Chair FPT 2011

7 Program Committee Member, PDP 2014

8 Program Committee Member VLSI Design 2011, 2012, 2013, 2014, 2015, 2016

9 Program Committee Member, IndoCrypt 2008.

10 Program Committee Member, ICSCN 2008

11 Program Committee Member, ATS 2007.

12 Track Chair VLSI D 2010, 2014

Reviewer Assignments

- VLSI Design, DAC, DATE
- TVLSI, TCAD, TNano

Expert Committee Member

- Member of Smart Campus Committee of IIT Delhi
- Member (Systems Expert) on Institute Networks Committee. Systems Administrator of Computing Facilities of Department of Computer Science.
- Member in the Committee appointed by the Government of India to examine all technologies available for Electronic Toll Collection (ETC) for nationwide implementation

Miscelleneous

- Administrative assignments.

1. Help a New IIT Develop
   In the recent past, the government of India decided to to set up 8 new IITs and each of the 5 older IITs were asked to mentor one or more of the new institutes. IIT Delhi was the mentor for IIT Ropar. I was a key member of the team which set up networking infrastructure as well as the basic laboratory for the Computer Science and Engineering stream. In addition, I conceptualized and set up a video link so that classes could be conducted by IITD faculty from Delhi. This facility was very useful for students to interact with the teachers and TAs. This system was later replicated in many other instances. I also taught the Computer Architecture course for the students of IIT Ropar in that year.
2. Faculty in Charge — Robotics Club, Board of Students Activities IITD
3. Designed the IT Infrastructure of the largest Liver Diseases 200 bed Hospital in Asia (ILBS)
4. Reviewer of research proposals for Department of Science and Technology — the premier funding agency for S&T activities in India

- I am deeply committed to the concept of a building affordable solutions for the developing and under-served areas. Currently, we have an inexpensive solution for non-invasive Hb monitoring. We have also developed a smart phone based solution for quick detection of abnormalities in the eye. A mobile tablet based app "*Partograph*" has been developed and is in trial at 4 hospitals. This will go for nationwide trials starting January in 23 hospitals across India. All these are technology solutions which can be potentially help a lot of people. I work closely with government agencies involved in public health.

- I have been involved a distance education program run at IIT Delhi for Students in Ethiopia. This program demonstrates the viability of imparting graduate education using technology. A 2 way video link using dedicated IPLC connectivity allows real time interaction with students in Ethiopia. I have taught courses in Reconfigurable Computing, Advanced Computer Architecture and Operating Systems to these students over the past 3 years. A week's on-site mid term interaction with these students has helped me understand the nuances of teaching in different situations. This has also helped me in making subtle changes in the way I teach in IIT Delhi also.