

Kolin Paul

Curriculum Vitae

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H-index: 26 (link)
i10-index: 67 (link)

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- **Head** , SCHOOL OF INFORMATION TECHNOLOGY (SIT), IIT Delhi.
Aug'23
- Jun'19- **Microsoft Chair Professor** , IIT Delhi.
Jun'24
- Sep'18- **Research Professor** , SCHOOL OF IT, TalTech, Tallinn, Estonia.
Aug'19
- Sep'16- **Head** , EDUCATION TECHNOLOGY SERVICES CENTER (ETSC), IIT Delhi.
Aug'17
- Dec'10- **Associate Professor** , DEPT OF COMPUTER SCIENCE AND ENGINEERING
Jan'17 (CSE), IIT Delhi.
- Aug'12- **Associate Professor** , DEPT OF COMPUTER SCIENCE AND ENGINEERING
Jun'13 (CSE), IIT Bombay.

May'04– **Assistant Professor** , DEPT OF COMPUTER SCIENCE AND ENGINEERING (CSE),
 Aug'10 IIT Delhi.

Aug'10– **Visiting Researcher** , DEPT OF ICT, KTH, Stockholm, Sweden.
 Nov'10

Jul'03– **Lecturer**, DEPT OF COMPUTER SCIENCE AND ENGINEERING (CSE), University
 May'04 of Bristol, UK.

Jan'02– **Visiting Researcher**, DEPT OF COMPUTER SCIENCE AND ENGINEERING (CSE),
 Jun'03 Colorado State University, Fort Collins, USA.

Dec'00– **Senior Software Engineer (Technical lead)**, IBM SOFTWARE LABS INDIA,
 Jan'02 Bangalore, India.

Dec'97– **Research Scientist**, BE COLLEGE SHIBPUR, Kolkata, India.
 Dec'00

Aug'95– **Lecturer**, REC SILCHAR, Silchar, India.
 Dec'97

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 Referred Journals: 50
 Refereed Conferences : 115
 Books : 3
 Book Chapter: 2
 Patents 7 [*Filed and granted*]
 h-Index: 27 Citations: 2486 [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* : 13 [IITD] 2 [KTH] *Ongoing*: 6
 DM : 2

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

Publications

Google Scholar:

H-index: 27 ([link](#))

i10-index: 72 ([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 Buser, 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 ICES- 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, Guillermo 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*.
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- 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 lenne, 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.
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- 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.*
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- 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. Purkayastha, 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 Cosupervised the work of two students studying at KTH
 - 1 Syed Mohammad Asad Hassan Jafri 2013
 - 2 Liu Pei 2015

OnGoing

- 1 *Saurabh Tiwari* : [Started Jan 2016] CGRA architectures for ML code(proposed) Co Supervisor Anshul Kumar
- 2 *Arun Singh* : [Started Jan 2018] Security Extensions for low power ARM processors
- 3 *Sandeep Debnath* : [Started Jan 2018] H/w Security extensions for Processors in Drones
- 4 *Vijay Kumar* : [Started Jan 2018] Embedded Systems for Fundus Imaging Screening of ROP and Plus Disease
- 5 *Priyanka Chauhan* : [Started Jan 2020] Screening Devices for Cardiac Problems
- 6 *Aarushi Ranjan* : [Started Jan 2021] TBD

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 Ophthalmoscope (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 Wavefront 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

Miscellaneous

- Administrative assignments.

1 Help a New IIT Develop

In the recent past, the government of India decided 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 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 potentially help a lot of people. I work closely with government agencies involved in public health.
- I have been involved in 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.