



Dr. Debarka Mukhopadhyay

Designation

Associate Professor, *Department of Computer Science & Engineering.*

Education

Doctorate of Philosophy(Ph.D.), *Computer Science & Engineering.*

Master of Technology(M.Tech), *Computer Science & Engineering.*

Graduate Aptitude Test In Engineering(GATE).

Bachelor of Engineering (B.E), *Electronics & Telecommunication Engineering.*

Research Interest

Quantum Dot Cellular Automata, *Machine Learning.*

Teaching Interest

Computer Organization, *Design and Analysis of Algorithm*, *Data Structure*, *Operating System.*

Experience

Academic – 8 years, *Industry–3 years.*

Sponsored Projects

- Project Title Electromagnetic Wave generation methodology using power efficient molecular Quantum Dot Cellular Automata.

Principal Investigator Dr. Debarka Mukhopadhyay

Funding Agency Science and Engineering Research Board (SERB), Government of India

Project Scheme Teachers Associateship for Research Excellence (TARE)

Research Grant Rs. 5 lakhs per annum (50% each to host and parent institution)

2. Project Title On design of an ultra low power water purification system using Molecular Quantum Dot Cellular Automata based nanotechnology.
- Principal Investigator Dr. Paramartha Dutta
- CO-Principal Investigator Dr. Debarka Mukhopadhyay
- Funding Agency Dubai Future Foundation, The United Arab Emirates
- Project Scheme MBR Space Settlement Challenge
- Research Grant 60 000 AED

Patents

International

1. Title ***A portable molecular quantum dot cellular automata X-Ray system and Method of its operation thereof.***
- IPO Number with Filing date 201631033793; 03/10/2016
- Publication Date 24/03/2017
- PCT Number with Filing date PCT/IB2017/050329; 23/01/2017
2. Title ***Quantum Dot Cellular Automata based Food Irradiation System and Method of its working***
- IPO Number with Filing date 201631045060 A; 30/12/2016
- PCT Number with Filing date PCT/IB2017/050660; 08/02/2017
3. Title ***Quantum Dot Cellular Automata based Portable Cancer Cell Demolition System and Method of its operation thereof***
- IPO Number with Filing date 201631041316; 02/12/2016
- PCT Number with Filing date PCT/IB2017/050622; 04/02/2017
4. Title ***Quantum Dot Cellular Automata based Radiation Knife for Radio-surgery and Method of its working***
- IPO Number with Filing date 201631045061; 30/12/2016

PCT Application PCT/IB2017/051596; 20/03/2017
No with date

5. Title **Quantum Dot Cellular Automata based Portable Industrial Radiography System**
IPO Number with Filing date 201731000500; 05/01/2017
PCT Application PCT/IB2017/051624; 21/03/2017
No with date

National

6. Title **A Molecular QCA based Bug Zapper System**
IPO Number with Filing date 201731011403; 30/03/2017
7. Title **A Molecular QCA based Ultraviolet ray generating unit for light Therapy**
IPO Number with Filing date 201731011398; 30/03/2017
8. Title **A Molecular QCA based CT Scan System**
IPO Number with Filing date 201731011402; 30/03/2017
9. Title **A Molecular QCA based UV lamp for Water purification**
IPO Number with Filing date 201731011405; 30/03/2017

Publications

International and National Conference Publications

- Mili Ghosh, Debarka Mukhopadhyay, Paramartha Dutta, "A 2 Dot 1 Electron Quantum Cellular Automata based Parallel Memory", Vol 339, pp.627-636, **Advances in Intelligent Systems and Computing, Springer India**, INDIA 2015.
- Paramartha Dutta, Debarka Mukhopadhyay, "New Architecture for Flip Flops using Quantum-Dot Cellular Automata" *Proceedings of the 48th Annual Convention of Computer Society of India*, Vol II, **Springer**, pp 707-714, 2013.
- Debarka Mukhopadhyay, Amalendu Si, "Quantum Circuit Synthesis and Optimization Apply-

- ing Genetic Algorithm", *National Conference on Computing and Systems 2010*, Department of Computer Sc. Burdwan University, WB, pp 80-85, 2010.
- K. Datta, D. Mukhopadhyay, P. Dutta, " Design of n-to-2n Decoder using 2- Dimensional 2-Dot 1-Electron Quantum Cellular Automata", *National Conference on Computing, Communication and Information Processing, Excellent Publishing House*, pp. 7791 (2015).
 - S. Mondal, D. Mukhopadhyay, P. Dutta "A Novel Design of a Logically Reversible Half Adder using 4-Dot 2-Electron QCA", *National Conference on Computing, Communication and Information Processing, Excellent Publishing House*, 2015, pp. 123-130, (2015).
 - Mili Ghosh, Debarka Mukhopadhyay, Paramartha Dutta, "A Novel Parallel Memory Design using 2 Dot 1 Electron QCA", *IEEE 2nd International Conference on Recent Trends in Information Systems*, PP. 485- 490 (2015).
 - Mili Ghosh, Debarka Mukhopadhyay, Paramartha Dutta, "2 Dimensional 2 Dot 1 Electron Quantum Cellular Automata Based Dynamic Memory Design", *Advances in Intelligent Systems and Computing (AISC), Springer*, (2015).
 - Kakali Datta, Debarka Mukhopadhyay, Paramartha Dutta, "Design of a Logically Reversible Half Adder using 2D 2-Dot 1-Electron QCA", *Advances in Intelligent Systems and Computing (AISC), Springer*, (2015).
 - Kakali Datta, Debarka Mukhopadhyay, Paramartha Dutta, "Design of a 2-Dot 1-Electron QCA Full Adder using Logically Reversible Half Adders", *IEEE ISACC 2015* (2015).
 - Mili Ghosh, Debarka Mukhopadhyay, Paramartha Dutta, "Design and Analysis of two dot one electron QCA ExOR Gate in Logically Reversible Gate Design", *IEEE International Symposium on Advanced Computing and Communication (ISACC)* 2015, Assam University, Silchar, India, pp. 275-280.
 - Kakali Datta, Debarka Mukhopadhyay, Paramartha Dutta, "Design of a binary to BCD conveter using 2D 2-Dot 1-Electron Quantum Dot Cellular Automata", *Procedia Computer Science*, pages 153-159, vol: 70, *Elsevier*, (2015).
 - Mili Ghosh, Debarka Mukhopadhyay, Paramartha Dutta, "2-Dimensional 2-Dot 1-Electron Quantum Cellular Automata-Based Dynamic Memory Design", *Proceedings of the 4th International Conference on Frontiers in Intelligent Computing: Theory and Applications (FICTA)*, pages 357-365, vol: 404, *Springer India*, (2015).
 - Kakali Datta, Debarka Mukhopadhyay, Paramartha Dutta, "Design of a Logically Reversible Half Adder Using 2D 2-Dot 1-Electron QCA", *Proceedings of the 4th International Conference on Frontiers in Intelligent Computing: Theory and Applications (FICTA)*, pages 379-389, vol: 404, *Springer India*, (2015).
 - Sunanda Mondal, Debarka Mukhopadhyay, Paramartha Dutta, "A Design Of a 4 Dot 2 Electron QCA Full Adder using Two Reversible Half Adders", vol 458. *Springer, Singapore*, pp 327-335 (2017).
 - Mili Ghosh, Debarka Mukhopadhyay, Paramartha Dutta, "A 2D 2 Dot 1 Electron Quantum Dot Cellular Automata Based Logically Reversible 2:1 Multiplexer", *IEEE International Conference on Research in Computational Intelligence and Communication Networks (ICRCICN)*, pp. 300- 305, (2015).
 - Kakali Datta, Debarka Mukhopadhyay, Paramartha Dutta, "Design of Ripple Carry Adder using 2-Dimensional 2-Dot 1-Electron Quantum-Dot Cellular Automata", *Springer India*, INDIA -2016, Vol: 1, PP: 263-270, (2016).
 - Kakali Datta, Debarka Mukhopadhyay, Paramartha Dutta, "Two-dot One-electron QCA Design of Parity Generator and Checker", *3rd International Conference on Microelectronics, Circuits and*

Systems, Micro 2016 (Accepted).

- Kakali Datta, Debarka Mukhopadhyay, Paramartha Dutta, "Design of a BCD Adder using 2-Dimensional Two-Dot One-Electron Quantum Dot Cellular Automata", 1st International Conference on **Intelligent Computing and Communication, Springer Singapore**, PP 345-354, 2017.
- M. Ghosh, D. Mukhopadhyay and P. Dutta, "Design of an Efficient 2-Dot 1 Electron QCA based Non-reversible Adder", in proceedings of 3rd International Conference on Microelectronic Circuit and System (Micro-2016), July 2016, PP 106-112, 2015, ISBN : 978-93-80813-45-5.

Journal Publications

- Debarka Mukhopadhyay, Paramartha Dutta. "Quantum Cellular Automata Based Novel Unit Reversible Multiplexer", **Adv. Sci. Lett. American Sci. Pub. (Scopus Indexed journal)** 16, 163-168 (2012).
- Debarka Mukhopadhyay, Paramartha Dutta, "Quantum Cellular Automata Based Novel Unit 2:1 Multiplexer". **International Journal of Computer Applications, (UGC Listed journal)** Vol 43, 2, (22-25) (2012).
- Debarka Mukhopadhyay, Sourav Dinda and Paramartha Dutta. "Designing and Implementation of Quantum Cellular Automata 2:1 Multiplexer Circuit". **International Journal of Computer Applications, (UGC Listed Journal)** Vol 25,1, (21-24), (2011).
- Debarka Mukhopadhyay, Amalendu Si, "Quantum Multiplexer Designing and Optimization applying Genetic Algorithm", **International Journal of Computer Science Issues, (UGC Listed journal)** Vol. 7, Issue 5, 2010.
- Debarka Mukhopadhyay, Paramartha Dutta, "A Study on Energy Optimized 4 Dot 2 Electron two dimensional Quantum Dot Cellular Automata Logical Reversible Flip Flops", **Microelectronics Journal, Elsevier (SCI Indexed Journal)**, vol 46, Issue 4, pp 519-530, 2015.
- Arighna Sarkar, Debarka Mukhopadhyay, "Improved Quantum Dot Cellular Automata 4:1 multiplexer circuit unit", **SOP Transaction on Nanotechnology**, Vol. 1, No.1, May 2014.
- Mili Ghosh, Debarka Mukhopadhyay and Paramartha Dutta, "A Study on 2 Dimensional 2 Dot 1 Electron Quantum Dot Cellular Automata based Reversible 2:1 MUX Design: An Energy Analytical Approach", **International Journal of Computers and Applications (Scopus Indexed Journal)**, Pages 82-95, Volume 38, 2016, Issue 2-3, **Taylor & Francis**.
- Kakali Datta, Debarka Mukhopadhyay and Paramartha Dutta, "Design and Analysis of an Energy Efficient and Compact Two-Dimensional Two-Dot One-Electron Quantum-Dot Cellular Automata Based Ripple Carry Adder", **International Journal of Convergence Computing (Scopus Indexed Journal)**, Volume 2, Issue 2, 161-182, **Inderscience Publishers**, 2016.
- Kakali Datta, Debarka Mukhopadhyay and Paramartha Datta, "Comprehensive Study on the Performance Comparison of Logically Reversible and Irreversible Parity Generator and Checker Designs using Two dimensional Two -dot One-electron QCA", **Microsystem Technologies (SCI Indexed Journal), Springer**, Volume 23, Number 1, PP.1-9, (2017).
- Mili Ghosh, Debarka Mukhopadhyay and Paramartha Datta, "Design of an Arithmetic Circuit using non-reversible adders in 2-dot 1 - electron QCA", **Microsystem Technologies (SCI Indexed Journal)**, Vol 23, Pages : 1-11, **Springer**, (2017).
- Kakali Datta, Debarka Mukhopadhyay and Paramartha Datta, "Comprehensive design and analysis of gray code counter using 2- dimensional 2-dot 1 electron QCA ", **Microsystem Technologies (SCI Indexed Journal)**, (2018), <https://doi.org/10.1007/s00542-018-3818-1>.
- Mili Ghosh, Debarka Mukhopadhyay and Paramartha Datta, "Influence of structure of 2 Di-

mensional 2 Dot 1 Electron QCA cells in design of a pipelined subtractor ", **Microsystem Technologies (SCI Indexed Journal)**,(2018) <https://doi.org/10.1007/s00542-018-3826-1>.

Membership

- 2011 **MIEEE**, *Member of The Institute of Electrical and Electronics Engineers.*
- 2012 **MACM**, *Member of the Association of Computing Machinery.*
- 2011 **LMIETE**, *Life member of the Institution of Electronics and Telecommunication Engineers.*
- 2010 **LMISTE**, *Life member of the Indian Society for Technical Education.*