

Meghna Sengupta

Doctoral Program
1st Year
Boston University, USA

309 Columbia St.
Cambridge, MA - 02141
USA
☎ (346)-290-0274
✉ meghna.816@gmail.com

Education

Academic Qualifications

Degree/Examination	Institute	Year	CGPA/%
Dual Degree – B.Tech and M.Tech in Computer Science & Engg.	Indian Institute of Technology, Kharagpur, India	2014-2019,	9.6 CGPA,
10 + 2 (All India Senior School Certificate Examination)	DAV Model School, IIT Kharagpur (CBSE board)	2014	97% Marks
10 (All India Secondary School Examination)	DAV Model School, IIT Kharagpur (CBSE board)	2012	10 CGPA

Notable Projects

May 2018–July 2018 **Summer Internship 2018**, Ruhr University, Bochum, Germany, Prof. Gregor Leander.

- The internship was part of the DAAD fellowship awarded to me. It was based on block ciphers and their analyses. Specifically, the work concerned a recently proposed 128-bit block cipher and the objective of the internship was to do a comprehensive algebraic analysis of the round function of the cipher and propose an upper bound for the algebraic degree of the same.

May 2017–July 2017 **Summer Internship 2017**, Katholieke University Leuven, Belgium, Prof. Ingrid Verbauwhede.

- The internship was about studying various post-quantum encryption schemes and their applications and importance. The objective of the internship was to improve the software implementation of the ring - Learning with errors encryption scheme. The work has targeted to improve the algorithm for calculating the Number Theoretic Transform which is used for polynomial multiplication in the encryption scheme. Additionally, the modular reduction algorithm is also improved to gain on performance.

July 2018– (ongoing) **M.Tech Project**, *Indian Institute of Technology Kharagpur, India*, Prof. Abhijit Das.

- Implementation and subsequent optimization of the Digital Signature Batch verification algorithm in Koblitz curves using Single Instruction, Multiple Data (SIMD) instructions. The objective is to achieve a better performance of the signature scheme implementation. The required binary Galois Field library consisting of the optimized instruction set has also been built.

Jan 2017–April 2018 **B.Tech Project**, *Indian Institute of Technology Kharagpur, India*, Prof. Abhijit Das.

- Implementation of the standard digital signature schemes such as Elliptic Curve Digital Signature Algorithm (ECDSA) using Single Instruction, Multiple Data (SIMD) instructions to achieve a better performance of the signature scheme implementation. Other modifications to improve the existing implementation are also being explored.

June 2016–July 2016 **Summer Internship 2016**, *University of Washington, USA*, Prof. Arvind Krishnamurthy.

- The project involved resource allocation for developing a network switch in a distributed environment. The objective of the project was to optimize the resources used in the network switch for a specific network topology. To achieve the objective, certain open source constraint solvers and SAT solvers were explored and utilized.

2016 **Software Development Work**, *Indian Institute of Technology Kharagpur, India*, Prof. P. P. Das.

- Performing structured analysis and structured design for a complete software automation for a medicine shop. It reduces inventory management overhead by implementing the just-in-time (JIT) philosophy. JIT encompasses all activities required to make a final product from design engineering onwards to the last manufacturing operation.

2016 **Processor Design and Implementation**, *Indian Institute of Technology Kharagpur, India*, Prof. D. Sarkar.

- Designing a 16-bit processor and implementing the same in Verilog. The processor supported most of the basic MIPS instruction set. The design has been simulated on a Xilinx Spartan 6 board and all the functionalities have been tested.

Technical and Personal skills

○ Teaching Experience:

- Have experience as a teaching assistant for the course on *Discrete Structures* for one semester.
- Teaching Assistantship for the online NPTEL course on *Embedded Systems*.

○ Programming Languages: Proficient in: C, C++, Python. Also basic ability with: Assembly, Verilog, VBA, VHDL.

○ Industry Software Skills: Have experience in working with Hadoop and Hive; SolidWorks, Matlab, Most MS Office products.

○ General Business Skills: Good presentation skills, Work well in a team.

Publications

- Meghna Sengupta, Swapan Maiti, Dipanwita Roy Chowdhury. "Nonlinear Error Correcting Codes Using Cellular Automata". Exploratory paper, AUTOMATA 2018 - Ghent University, Belgium, June 2018.
- Meghna Sengupta, Swapan Maiti, Dipanwita Roy Chowdhury. "Generic Construction of Nonlinear Codes Using Cellular Automata". Submitted to the journal *Natural Computing*, Springer (Extended version of AUTOMATA 2018 paper, invited through conference)

Conferences Attended

- INDOCRYPT 2014
- AUTOMATA 2015
- AUTOMATA 2018

Awards and Recognitions

- Ranked among the **top 1% of all the students** from all branches in the institute.
- Presently has the **highest CGPA among all the female students** in the batch from all the branches in the institute.
- Awarded the **Sikharini Nag Memorial Award** for securing highest CGPA among all female students of all Engineering branches of the institute at the end of the sixth semester.
- Chosen among the **top 30 students** (based on academic performance) of the country to participate in an ideation session conducted as a flagship mission of the government of India in the making of a new India.
- Received the prestigious **Mamraj Aggarwal Rashtriya Puraskar award** in 2014 for securing high marks in the All India Senior School Certificate (AISSCE) Examination (presented by the Hon. Governor of West Bengal).
- Became a **Jagadis Bose National Science Talent Search (JBNSTS) scholar** in 2014-15
- Received the **INSPIRE scholarship** in 2014 (awarded to the top 1% scorers of the CBSE class 12 exam (about 960,000 candidates))
- Qualified the **Regional Mathematics Olympiad (RMO)** Level - I in 2010-11
- Secured a High Distinction in **Australian Mathematics Competition (AMC)** in 2010-11

Interests and extra-curricular activity

- Group Leader, National Service Scheme, I.I.T. Kharagpur
 - Led a team of 18 volunteers for collection of clothes for donation to the underprivileged sections of the society.
 - Regularly taught in two schools for underprivileged kids over a period of two years.
- Painting – Passionate about painting and completed the 5-yr certificate course offered by Rabindra Charukala Parishad with multiple gold medals.

- Recitation and singing – Participated in various state-level cultural programmes
- An avid reader of all kinds of books