Manish Kumar Bera

Fifth Year Dual-degree Student
Department of Computer Science and Engineering
Indian Institute of Technology, Kanpur

bera.manish.kumar@gmail.com
+91-80042-41340

Educational Qualifications

Year	Degree	Institution(Board)	CGPA/%
2015 – Present	Dual degree, CSE	Indian Institute of Technology, Kanpur	10.0(PG), 9.6(UG)
2015	AISSCE – XII	Central Board of Secondary Education (CBSE)	95%
2013	AISSE – X	Central Board of Secondary Education (CBSE)	10.0/10.0

Scholastic Achievements

- Awarded **SURF (Summer Undergraduate Research Fellowship)**, California Institute of Technology
- Awarded **SURGE (Summer Undergraduate Research and Graduate Excellence)** fellowship, IIT Kanpur
- Received **Academic Excellence Award** for sessions 2015-16, 2016-17, and 2017-18.
- **All India Rank 78**, KVPY 2013 (SA Stream)
- **All India Rank 416**, JEE Advanced 2015

Work Experience

- Tutor *Fall 2019*
- Teaching Assistant *Fall 2018, Spring 2019*
- Academic Mentor, Counselling Service *2016-17*

Projects

Reinforcement Learning in Partially Observable Environments
Prof. Anima Anandkumar (Caltech) Summer 2018
- Reviewed and implemented various Reinforcement Learning models based on partial observability assumption and explored variants of proximal policy optimization algorithms.

Multi-agent Path Synthesis for Detecting an Adversarial Evader
Prof. Indranil Saha (IIT Kanpur) Spring 2019, Summer 2019
- Analyzed the problem of multi-agent pursuit evasion in the context of a patrol system, and proved that the problem is decidable.

Generalized sketching for kronecker product regression
Prof. Sumit Ganguly (IIT Kanpur) Spring 2019, Summer 2019
- Developed generalized sketching matrices for kronecker product regression from sketching matrices for approximate regression.

Extreme Multi-Label Learning
Prof. Piyush Rai (IIT Kanpur) Fall 2018-present
- Proposed a clustered multi-task one-class method for multi-label problems, and developed an alternating optimization scheme to solve the model.

Smart Surveillance
Dr. Medha Atre (Oxford University) Spring 2018
- Proposed a context agnostic method to detect anomaly using NLP and Information Theory.

Sharing Aware Cache Replacement Policies (CS622A)
Prof. Mainak Chaudhuri (IIT Kanpur) Fall 2018
- Worked on improving sharing-aware cache replacement policy for multi-threaded applications, and proposed modifications to existing evaluation metric of prediction strategy.

Compiler Design (CS335A)
Prof. Subhajit Roy (IIT Kanpur) Spring 2018
- Developed a Java-to-x86 compiler using javascript, and implemented classes, functions, floats and type casting.
- Adjudged one of the best projects.

NachOS (CS330A)
Prof. Mainak Chaudhuri (IIT Kanpur) Fall 2017
- Implemented SysCalls, Process Scheduling and Memory Management in NachOS and learned concepts of modern operating systems, including threads, remote procedure calls, and memory hierarchies.

SAT Based Motion Planning of a Multi-Robot System
Prof. Indranil Saha (IIT Kanpur) Fall 2017
- Reduced the problem of path-finding into a SAT problem, and used MAX-SAT to minimize sum-of-cost for the optimal makespan. Applied various optimizations for faster clause generation.

Skills

Programming Languages: C, C++, Java, Python, Javascript
Software, Tools & Libraries: pytorch, tensorflow, roboschool, octave, R, LaTeX, bash scripting, git, edward., Arduino IDE
Assembly Languages: MIPS, x86

Course Work

- **Machine Learning**
  Sketching and Sampling for Big Data Analysis, Convex Optimization, Topics in Probabilistic Modelling and Inference, Natural Language Processing, Machine Learning Techniques
- **Computer Systems**
  Advanced Computer Architecture, Computer Networks, Compiler Design, Operating Systems, Computer Organization
- **Algorithms and Automata**
  Formal Methods for Robotics and Automation, Theory of Computation, Design and Analysis of Algorithms, Data Structures and Algorithms