Chaitanya Agarwal

chaitanyaagarwal291@gmail.com | New York City, NY - New Delhi, India

Education

New York University	New York City, NY
Doctor of Philosophy in Computer Science	*Sep. 2023 – Present*
New York University	New York City, NY
Master of Science in Computer Science	*Sep. 2021 – May 2023*
Indraprastha Institute of Information Technology Delhi	New Delhi, India
Bachelor of Technology in Computer Science and Engineering, Minor in Economics	*Aug. 2016 – June 2020*

Publications

Chaitanya Agarwal, Shibashis Guha, Jan Křetínský, and M. Pazhamalai. *PAC Statistical Model Checking of Mean Payoff in Discrete- and Continuous-Time MDP*. Proceedings of the 34th International Conference on Computer-Aided Verification (CAV'22) 📄 ‹/›

Kelin Luo, **Chaitanya Agarwal**, Syamantak Das, and Xiangyu Guo. *The Multi-Vehicle Ride Sharing Problem.* Proceedings of the The 15th International Conference on Web Search and Data Mining (WSDM'22) 📄 ‹/›

Professional Experience

Intern May 2022 – Aug. 2022
Tesla Motors, Fremont, CA
- Designed computer vision solutions to replace battery manufacturing manual review processes at parity.
- Designed a C# runtime app to act as an intermediary between manufacturing machines and external vision libraries.

Software Engineer Dec. 2020 – May 2021
Samsung SDS, Gurugram
- Developed a fault-tolerant and scalable Spring microservices application for division project management.
- Led the architecture design and backend team.

Projects

Trace Partitioning for Refinement Type Inference ‹/› Sep. 2022 – Present
- Implementing the trace partitioning abstract domain in OCaml for a refinement type inference algorithm.

MiniOO Compiler Sep. 2022 – Dec. 2022
- Implemented a compiler in OCaml for a well-defined object-oriented programming language.

Neural Collapse and Generalization 📄 Jan. 2022 – May 2022
- Established concrete mathematical links between neural collapse and generalization by tying together more than 15 research papers involving advanced probability, optimization and information theory.
- Contrary to initial opinion, showed that neural collapse doesn't imply generalization, pointed out the gaps behind this, and discussed potential research directions to fill them.

Hiding Metadata from Email Servers 📄 ‹/› Jan. 2022 – May 2022
- Created a novel protocol to anonymise email communication while ensuring value-added services like spam filtering, keyword search etc.

Community Detection on Networks 📄 Jan. 2019 – June 2020
- Bachelor's thesis on community detection algorithms through modularity maximization with theoretical guarantees.
- Explored algorithmic frameworks like feature-parameterized tractable and semi-supervised active algorithms.

Quantum Algorithm for Community Detection on Networks 📄   Jan. 2020 – June 2020
- Developed a novel community detection algorithm for quantum annealers using the QUBO framework

Cryptocurrency Consensus Protocols 📄 </>   Sep. 2022 – Dec. 2022
- Researched and implemented cryptocurrency consensus protocols in Elixir.
- Created artificial network attacks for deeper evaluation.

TECHNICAL SKILLS

Languages: OCaml, Python, Java, C#, Elixir, SQL, C++
Libraries and other Tools: NumPy, Git, Linux, Spring, PyTorch, .NET, Django, LaTeX, Halcon
Advanced Coursework: Abstract Interpretation, Honors Programming Languages, Distributed Systems, Networks and Mobile Systems, Introduction to Quantum Computing, Mathematics of Deep Learning, Approximation Algorithms, Randomized Algorithms

OTHER ACTIVITIES

Teaching Assistant   Jan. 2020 – June 2020
- Worked under Prof. Syamantak Das for the Algorithm Analysis and Design course at IIIT Delhi
- Conducted tutorials for more than 30 sophomore students, created programming assignments, graded assignments and examinations

Teaching Assistant   Aug. 2018 – Nov. 2018
- Worked under Prof. Donghoon Chang for the Discrete Mathematics course at IIIT Delhi
- Conducted weekly tutorials for more than 30 sophomore students, created tutorial and assignment questions, graded assignments and examinations

Student Volunteer   Dec. 2018 – June 2020
- Volunteer at National Association for Blind, Hauz Khas, New Delhi
- Helped students in painting, paperwork and various tasks in their daily lives

Student Mentor   Aug. 2018 – Apr. 2019
- Mentored 7 fresher students at IIIT Delhi
- Helped them in adjusting to academic and college life
- Conducted weekly meetings to understand problems faced by students