Pranay Mundra Email : pmundra@ur.rochester.edu
https://mundrapranay.github.io

Education

University of Rochester Rochester, NY
Ph.D. in Computer Science *July 2021 - Present*

University of Washington Seattle, WA
Bachelor of Science in Mathematics *September 2017 - June 2021*

Focus: Database Systems, Natural Language Processing(NLP), Optimization, Scientific Computing, Machine Learning

Programming Skills

Languages: Go, Java, Python, SQL, C++, JavaScript

Technologies: AWS, Pytorch, SQL-Server, Boost-Python, React

Experience (Research & Industry)

University of Rochester Rochester, NY
Graduate Research Assistant *July 2021 - Present*

- Advisor : Prof. Fatemeh Nargesian

Caltech Tensorlab Pasadena, CA
Undergraduate Machine Learning Researcher *June 2020 - April 2021*

- Working on the problem of **Neural Program Synthesis**.
- Coming up with a **language agnostic** parse tree representation of source code in Java & Python.
- Leveraging **TreeLSTMs** models and the **parse tree representation** to solve **masked node prediction** and using language specific grammar to get a syntactically correct code snippet.
- Advisors : Animashree Anandkumar and Forough Arabshahi.

University of Washington Database Group Seattle, WA
Undergraduate Research Assistant *January - December 2020*

- Worked on **LightDB**, a DBMS that allows querying over all forms of video data, including virtual reality, augmented reality videos.
- Mapped a high-level Python API to the low-level constructs (i) without sacrificing performance, (ii) minimizing device transfer, and (iii) enabling query expression to a wider audience.
- Advisor: Brandon Haynes.

University of Washington Database Group Seattle, WA
Undergraduate Research Assistant *April - September 2019*

- Created **Maimon**, a system for discovering approximate acyclic schemas using **MultiValued Dependencies** from relations.
- Optimized the MVDMiner to **reduce number of file scans**; taking advantage of **Information Theory** to prune out MVDs and calculate the entropies using the already discovered MVDs; compared the performance tradeoff between in-memory database system (H2) and MySQL.
- Paper accepted for **SIGMOD 2020**.
- Advisors : Batya Kenig and Dan Suciu.

Qurb Limited London, UK (worked remotely)
Web Developer Intern *July - September 2018*

- Built **chat bots and web applications** from scratch using MERN stack and Microsoft Bot Framework.
- Shifted NameDrop(written using node & express) to the REACT Framework.
- **Improved the whitelisting feature** for UntrackME; also added a new feature in the application using the Have I Been Pwned API to inform users about the strength of their passwords and whether their credentials were part of a data leak.

Teaching Experience

Department of Computer Science, University of Rochester Rochester, NY
Graduate Teaching Assistant *January - May 2022*

- Assistant to the Professor for CSC 263/463 - **Data Management Systems**
- Headed weekly discussion section & office hours reinforcing lecture topics, helped students with homework setups and debugging.

Paul G. Allen School of Computer Science & Technology Seattle, WA
Undergraduate Teaching Assistant *January - March 2021*

- Assistant to the Professor for CSE 444 - **Database Systems Internals**
- Head weekly discussion section & office hours reinforcing lecture topics, help students with homework setups and debugging.
- Work on homework autograders to automate grading.

Paul G. Allen School of Computer Science & Technology Seattle, WA
Undergraduate Teaching Assistant *September - December 2020 (Third Quarter)*

- Assistant to the Professor for CSE 414/344 - **Introduction to Database Systems**
- Headed weekly discussion section & office hours reinforcing lecture topics, helped students with homework setups and debugging.
- Automated grading using gradescope autograder framework.
- **Previous Quarters:** Winter 2020(Jan - March), Spring 2019(April - May).

Projects

SimpleDB: Implemented a multi-user transactional database server written in Java.

Husky Map Server: Created a google map for the University of Washington campus, which shows the shortest path between two locations.

Flight Booking Application: Implemented a flight booking service with user management, transaction support, itinerary search & reservations.

Spotify Song Explorer: Web Application that allows visualization of different audio features for Top 50 songs, fetched using the Spotify API.

Publications

Mining approximate acyclic schemes from relations: Batya Kenig, **Pranay Mundra**, Guna Prasaad, Babak Salimi, and Dan Suciu. In Proceedings of the 2020 International Conference on Management of Data, **SIGMOD** Conference 2020, June 14-19, 2020, pages 297–312. ACM, 2020.[**Paper**]

Compositional Generalization with Tree Stack Memory Units: Forough Arabshahi, Zhichu Lu, **Pranay Mundra**, Sameer Singh, Animashree Anandkumar. arXiv Preprint.[**Paper**]

Relevant Courses

Computer Science (Graduate): Advanced Algorithms; Analytical Methods in Computer Science; Machine Learning, Parallel & Distributed Systems

Mathematics (Undergraduate): Honors Calculus I, II, III; Real Analysis I, II; Linear Analysis; Probability I, II; Differential Equations, Linear Algebra, Numerical Analysis I, II(Winter 2021); Modern Algebra I, II(Winter 2021); Combinatorial Theory I, II(Winter 2021).

Computer Science (Undergraduate): Computer Programming I, II; Introduction to Database Systems; Database Systems Internals; Data Structures & Algorithms; Linux Fundamentals; Introduction to Artificial Intelligence;