

# Anakin Dey

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## EDUCATION

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### University of Illinois Urbana-Champaign

*Bachelors of Science in Mathematics, Minor in Computer Science*

May 2024

GPA: 3.91/4.00

## EXPERIENCE

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### Software Engineering Intern: CME Group

Jun 2022 – Present

- Refactored large code bases in order to support multiple file formats and platforms for tracing and logging of messages, resulting in tracing having less of a negative impact on the performance of applications
- Used Jenkins, XL Release, and in-house tools to benchmark the performance impact from using the new formats
- Explored the use of open-source dashboards and parsers to better process traces and give new insights to data

### Intro to Algorithms Course Assistant: UIUC

Jan 2022 – Present

- Teaching theoretical computer science concepts such as state machines, divide-and-conquer, dynamic programming, and graph algorithms by presenting topics in a clear and concise manner
- Teaching how to write proofs of algorithms for problems as well as helping with smaller Python assignments
- Holding office hours and helping students in class forums of 400+ students with both concepts and homework

### Learning, Decision, Control, Autonomy Lab: UIUC

Aug 2021 – Present

- Research interests lie in multi-target and multi-agent planning and movement under multiple constraints
- Combining concepts from heuristic approximation algorithms, Markov decision processes, probability theory, geometry, and graph theory to design new and efficient heuristics to use with various algorithms
- Benchmarking algorithms in Python and using Matplotlib, NetworkX, and OSMnx to create diagrams and charts
- Maintaining high code quality with various tools and workflows such as Black, Pytest, Flake8, and MyPy

### Discrete Structures Course Assistant: UIUC

Aug 2021 – Present

- Teaching concepts such as algorithmic runtime, trees, graphs, recursion, and set theoretical operations by integrating both mathematical and computer science perspectives
- Lead student group discussions by walking through course problems and solutions and explaining concepts in a comprehensible and digestible manner both in an online forum of 400+ students and in class

### Software Engineering Intern: SiteIQ

May 2021 – Aug 2021

- Improved the accuracy of status reports from multiple fueling stations using Python and JavaScript by streaming and parsing data sources such as two-wire serial and ZMODEM files
- Identified error codes and data that were not described in given documentation but present in 50% of devices and logged them for further analysis by the team
- Presented findings to managers and coworkers with multiple levels of technical understanding

## PUBLICATIONS

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### Post-Disaster Repair Crew Assignment Optimization Using Minimum Latency

*Anakin Dey, Melkior Ornik (To appear in [IEEE ISC2 2022](#))*

- Designed a new multi-agent heuristic algorithm to solve a weighted path planning problem in the context of outage restoration after natural disasters which was up to 50% better than existing heuristics
- Implemented and tested a graph class and algorithms in Python using Pytest and Coverage.py for code validation
- Paper on [arXiv](#) and source code on [GitHub](#)

## EXTRACURRICULARS

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### Admin: SIGPwny | Security Interest Group

- Hosted [2 meetings](#) on cryptographical concepts including block ciphers, RSA, Diffie-Hellman, and elliptic-curve cryptography, complete with multiple challenges, to over 50 people per meeting
- Created cryptography and reverse engineering challenges for [UIUCTF 2021](#) and [2022](#) for over 1400 participants
- Provided support to participants of CTFs who are new to security by answering questions and teaching concepts

## TECHNICAL SKILLS

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**Languages:** Python, Java, C++, JavaScript, TypeScript, Agda, C

**Tools / Frameworks:** Bash, Git, MyPy, Pytest, Matplotlib, NetworkX, Numpy, GDB, Catch2, Node.js, Pandas, Jira, XL Release, Jenkins, Grafana