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https://github.com/Siddhant-Ray (GitHub)

Siddhant Ray

Education

2023 – 2028 **The University of Chicago**, *PhD in Computer Science*
Advisor - Junchen Jiang and Nick Feamster

2020 – 2022 **ETH Zürich**, *MSc in Electrical Engineering and Information Technology*
Advisor - Laurent Vanbever

2016 – 2020 **VIT Vellore**, *B.Tech in Electronics and Communication Engineering*

Experience

Sep 2023 – Present **Graduate Research Assistant**, *Computer Science Department, The University of Chicago*

- Tranformer based model for predicting changes in network latency for use in active queue management and multipath routing.
- Resource allocation and sharing for optimally serving multi-tenant Retrieval Augmented Generation(RAG) LLM systems.

Sep 2022 – Mar 2023 **Cloud Networks Researcher**, *Advanced Network Architecures Lab, UPC Barcelona*

- Analysed reinforcement learning based resource sharing, offloading and allocation for cloud-edge systems.
- Developed an approximation for a Mixed-Integer Optimal Matching Algorithm for resource allocation to reduce execution time by 2.5-3x.

Oct 2021 – Sep 2022 **Graduate Research Assistant**, *Law, Economics, and Data Science Group, ETH Zurich*

- Research Assistant to Professor Dr. Elliott Ash and worked on improving semantic labelling for text corpora using newer NLP models, sentence simplification and clustering for topic modelling.
- Worked on paraphrase mining to determine clusters of similar narratives in legal corpora and use NLP models to capture underlying narratives in meat policy documents to analyse political discourse.

May 2019 – July 2019 **Software Development Intern**, *Capgemini Engineering*

- Developed a K-Shortest Path Searching algorithm for ONOS based Software Defined Layer 2 VPNs.
- Algorithm was subject to dynamic constraints of network resources (e.g.required edges, vertices etc.) to be used for path calculation.

May 2018 – July 2018 **Software Development Intern**, *BlueStacks*

- Worked on a machine learning algorithm to predict the App Engine's appropriate display screen based on the customer's past experiences.
- Developed an automation script for generating SVG cards for the App Engine's game front end and an address verification tool using the EasyPost API.

Publications

2024 **Siddhant Ray**, Xi Jiang, Zhuohan Guo, Junchen Jiang, and Nick Feamster. Transformer-based predictions for sudden network changes. In *21st USENIX Symposium on Networked Systems Design and Implementation (Poster Session)*, NSDI '24. USENIX Association, 2024.

2024 Yuhan Liu, Hanchen Li, Yihua Cheng, **Siddhant Ray**, Yuyang Huang, Qizheng Zhang, Kuntai Du, Jiayi Yao, Shan Lu, Ganesh Ananthanarayanan, Michael Maire, Henry Hoffmann, Ari Holtzman, and Junchen Jiang. Cachegen: Kv cache compression and streaming for fast language model serving. To appear in SIGCOMM '24, 2024.

2022 Alexander Dietmüller, **Siddhant Ray**, Romain Jacob, and Laurent Vanbever. A new hope for network model generalization. In *Proceedings of the 21st ACM Workshop on Hot Topics in Networks*, 2022.

2020 **Siddhant Ray** and Budhaditya Bhattacharyya. Machine learning based cell association for mmtc 5g communication networks. *International Journal of Mobile Network Design and Innovation*, 10(1):10–16, 2020.

Skills

Programming Python, C++, Java, Bash, Rust, SQL, C, TeX

Software Linux, Git, Docker, P4 switches, ONOS, Google Cloud, AWS, Maven, MATLAB, NetSim, Cadence

Frameworks Mininet, FRRouting, PyTorch, TensorFlow, Sklearn, NLTK, Flask, SciPy, Scapy, BS4, NS-3, Langchain, vLLM

Languages English (C2), Hindi, Bengali, Deutsch (B1)

Selected Projects

2022 Advancing Packet-Level Traffic Predictions with Transformers (Master Thesis) - [code, thesis]

2021 Towards a New Framework for Integration of Network Planes (Research Project) - [code]

2021 Attentive Neural Networks for News Classification (Research Project) - [code]

2021 Investigating Possible Inductive Biases in Local Sparse Attention ViT Architectures Against Traditional CNNs (Course Project) - [code, paper]

2021 Automatic Certificate Management Environment (Course Project) - [code]

2020 Maximizing Cross Traffic Flows in a L2/L3 Network with Programmable Switches (Course Project) - [code, poster]

2020 Machine Learning based Cell Association for 5G Communication Networks (Bachelor Thesis) - [code]

Relevant Courses

Graduate Approximation Algorithms, Algorithms, Advanced Computer Networks, System Security, Network Security, Distributed Computing, Discrete Event Systems, Networks Seminar, Introductory Machine Learning, Deep Learning, Learning and Classification Theory, Mathematics of Data Science, Neural Network Theory

Undergraduate Computer Networks, Operating Systems, Wireless Communication, Linear Algebra

Honors and Awards

2023 – 2028 **Liew Family Graduate Fellowship**, University of Chicago

2022 **Winner at Datathon**, *Microsoft Challenge*, ETH Zurich

2020 **Best Outgoing Student**, *SENSE department*, VIT Vellore

2019 **Runner-Up at VIT Hack**, *Education Track*, VIT Vellore

2016 – 2019 **Merit Scholarship for Academic Excellence**, VIT Vellore

Leadership and Volunteering

2019 – 2020 **Technical Advisor**, IETE VIT

2018 – 2019 **Organizer**, TEDx VIT Vellore

2017 – 2020 **President** (2018 – 2019) & **Outreach Worker**, Anokha NGO