

SAYAK CHAKRABARTY

 [linkedin.com/in/sayak-chakrabarty-cs](https://www.linkedin.com/in/sayak-chakrabarty-cs)  <https://www.github.com/hellokayasgithub.com/hellokayas>
 +1-802-698-3809  pidnas94335@gmail.com
 1800 Sherman Ave suite 3-000, Evanston, IL 60201  <https://hellokayas.github.io/>

My primary areas of research are Machine Learning, Statistical Modelling, Data Science, Design and analysis of algorithms. I completed my Masters of Mathematics from ISI Kolkata, India in 2020. I joined DSAIL lab at Dartmouth college as a PhD student under supervision of Prof. V.S. Subrahmanian. After spending my first year there, I transferred to Northwestern University and currently a third year PhD student in the Department of CS and working with Prof. VS Subrahmanian.

Education

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|--------------|-------------------------------------------------------------------------------------------------------|
| 2021-Present | PhD candidate, Department of Computer Science, Northwestern University |
| 2020-2021 | PhD candidate, Department of Computer Science, Dartmouth College |
| 2018- 2020 | Masters of Mathematics, Indian Statistical Institute (Kolkata) |
| 2015- 2018 | Bachelors of Science(Hons) in Mathematics and Computer Science, Chennai Mathematical Institute |

Professional Experience

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| Present
September 2021 | Graduate Research Assistant, Northwestern University, Computer Science Department <ul style="list-style-type: none">> Designed and implemented JUST, a logic based framework to assist judges reach better decisions in court cases> Ongoing work on fake news spread on Twitter <div>Python Scikit-learn Pytorch Pandas Networkx</div> |
| September 2021
September 2020 | Graduate Research Assistant, Dartmouth College, Computer Science Department <ul style="list-style-type: none">> Worked in a team and designed SockAttack algorithm, a deep reinforcement learning based algorithm that will avoid detections of RFDS and operate fake accounts on e-commerce websites efficiently> Built SockDef, a defense algorithm that mitigates the efficacy of SockAttack <div>Python Scikit-learn Pytorch Pandas Networkx</div> |
| 2020
2019 | Masters of Mathematics student, Indian Statistical Institute, Math-Stat Department <ul style="list-style-type: none">> Completed my Master's Project : Markov Chains and Monte Carlo Methods and FPRAS for bipartite graphs <div>Probability Theory Graph Theory</div> |

Publications

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| Accepted | A New Dynamically Changing Attack on Review Fraud Systems and a Dynamically Changing Ensemble Defense, 2020-2021, IEEE International Conference on Dependable, Autonomic and Secure Computing
Youzhi Zhang, Sayak Chakrabarty, Rui Liu, Andrea Pugliese and V.S. Subrahmanian
<div>http://www.wikicfp.com/cfp/servlet/event.showcfp?eventid=153958</div> |
| Ongoing Work | Preventing the spread of fake news in social media like Twitter, 2021-Present, Ongoing work
Youzhi Zhang, Sayak Chakrabarty, Andrew Pulver, Andrea Pugliese and V.S. Subrahmanian
<div>Not yet submitted anywhere</div> |
| Submitted | Judicial Support Tool : Finding the k-Most Probable Judicial Worlds, 2021-2022, AAAI 2023
Maksim Bolonkin, Sayak Chakrabarty, Cristian Molinaro and V.S. Subrahmanian
<div>https://aaai.org/Conferences/AAAI-23/</div> |
| Accepted | The Repeated Divisor Function and Possible Correlation with Highly Composite Numbers, 2017, International Workshop for Young Mathematicians "Number Theory", Poland
Sayak Chakrabarty, Arghya Datta
<div>http://kmsuj.im.uj.edu.pl/workshop2017/index.php.html</div> |

Skill

Programming Language : **Python**, C++, SQL, Haskell
Operating Systems : **Windows**, Linux
Tools and Framework : **Pandas, Scikit-learn, Networkx, NumPy, Matplotlib, Seaborn**, PyTorch, R, LATEX, Git, Excel
Statistical Skills : **Regression Analysis, Testing of Hypothesis : A/B testing**, Probability theory

Fun Projects

A fast SVD algorithm https://github.com/hellokayas/Some-Programming-Samples/blob/master/faster_SVD.py
Prophet Algorithm for Stock Price Prediction <https://github.com/hellokayas/Some-Programming-Samples/blob/master/Stock.ipynb>

Relevant Courses

2022 **Logic in Artificial Intelligence**, Northwestern University
2022 **Machine Learning**, Northwestern University
2022 **Introduction to Data Science Pipeline**, Northwestern University
2022 **Graduate Course on Design and Analysis of Algorithms**, Northwestern University
2022 **Combinatorial Optimization**, Northwestern University
2022 **Theory of Computational Complexity**, Northwestern University
2022 **Advanced Graphics**, Northwestern University
2022 **Quantum Computation**, Northwestern University
2021 **Mechanism Design**, Northwestern University
2021 **Randomized Algorithms**, Dartmouth College
2021 **Topics in Probability**, Dartmouth College
2020 **Game Theory**, Indian Statistical Institute
2017 **Stochastic Processes**, Chennai Mathematical Institute
2016 **Advanced Programming**, Chennai Mathematical Institute
2016 **Discrete Mathematics and Graph Theory**, Chennai Mathematical Institute

Awards

2022 **Best Paper Award**, The 20th IEEE International Conference on Dependable, Autonomic and Secure Computing (DASC 2022)
2019 **International Youth Math Challenge**, Indian Institute of Technology
2017 **Science and Engineering Research Board International Travel Award**, Department of Science and Technology, India
2014 **Mathematical Talent Reward**, Indian Statistical Institute