Yatharth Goswami
Sophomore B.Tech Student
Computer Science and Engineering
Indian Institute of Technology Kanpur

yatharth0610.github.io
ygoswami@iitk.ac.in
github.com/yatharth0610

ACADEMIC DETAILS

Examination	University	Institute	Year	CPI/%
Graduation	IIT Kanpur	IIT Kanpur	2020	9.7
Intermediate/+2	HSC	Alpha Junior College of Science	2019	90.31
Metriculation	Board of Sec. Education, Rajasthan	SMJT Senior Sec. School, Bikaner	2017	93.67

Pursuing **Honors** in Computer Science and Engineering.

FIELDS OF INTEREST

- I am interested in Blockchains, Quantum Algorithms, Game Theory, Cryptography, NLP, Graph Theory and Algorithms. Anything that involves any bit of mathematics in it, interests me.

ACADEMIC ACHIEVEMENTS

- Secured **All India Rank 110** in **JEE Advanced 2019** among 2.3 Lakh eligible aspirants *(2019)*
- Secured **All India Rank 448** in **JEE Mains 2019** among 11,57,125 candidates *(2019)*
- **Academic Excellence Award** for exceptional performance in Academics at IIT Kanpur *(2019)*
- Recipient of prestigious **KVPY fellowship** by Dept. of Science and Technology, Govt. of India *(2018,2019)*
- Recipient of prestigious **Director's Scholarship** for being in top 4 at IIT Kanpur. *(2020)*
- Recipient of Annual Scholarship under **State Talent Search Examination** scheme (STSE). *(2017)*
- Received **Gold Medal** and **Certificate of Merit** for being in the national top 42 candidates at INChO *(2019)*
- Amongst the top 1% students across the nation in **NSEA** who were selected to appear for **INAO**. *(2019)*
- Secured perfect **10.0/10.0** grade points in all courses in the autumn semester of the freshman year *(2019)*

KEY PROJECTS

- **IITK Bucks** *Code Here* *Summer 2020*
  Institute Summer Project *IIT Kanpur*
  - Implemented a **Fully Functional** Node of blockchain using NodeJS.
  - Learned about the basics of the functioning of **Blockchains** and **Crypto-Currencies** along with Cryptographic techniques like asymmetric cryptography to make **anonymous** transactions with the help of various assignments. ***Code Here***
  - Learned about Programming Concepts specific to **JavaScript** like **Async Functions** and **Event Loops**.
  - Learned about **Tunneling Softwares** like **ngrok** and used them to test the nodes.
  - Implemented the **Miner** using the concepts of **Multithreading** in NodeJS.

- **Distributed Mechanism Design using Blockchains** *Code Here* *Oct2020-Nov2020*
  Guide: Prof. Swaprava Nath | CS711 Course Project *IIT Kanpur*
  - Implemented various **Sealed-Bid Auction Mechanisms** using **Enigma's Secret Contracts.**
  - Learned about various problems in Blockchains related to **privacy** and tackling them using modern Cryptographic Primitives like **Secure MPC**.
  - Modelled a game theoretic version of privacy problem in Blockchain as **Normal Form Game** and inferred various **equilibriums** that may be present according to different applications.
  - Presented an analysis of how effective the current Enigma Protocol is, and proposed an **alternative better approach** for a particular step by using **VCG Mechanisms.**

- **C3i Graphs** *Ongoing*
  Research Project *C3i Centre, IIT Kanpur*
  - Working on application of **graph embeddings** in the field of malware analysis.
  - Studying ways of converting **function call graph** of a binary into the corresponding graph embedding.
  - Learnt about various techniques to extract important features out of a graph and use them for classification tasks.

MISCELLANEOUS

- **HCL-C3i Hub Cybersecurity Hackathon** *Code Here* *Jul2020-Aug2020*
  Team Hackermen69
  - Ranked **25th** out of around **3400** teams from all around the world.
  - Built a **Deep Learning** based solution to distinguish Malicious DOS executables from Benign ones by studying the **PE** files provided.
  - Built a **Deep Learning** based solution which would take input as Packets streamed from the network of a user in form of **Pcap** files and classifies if the Packet is a part of Botnet traffic or not.

- **Quantum Computing With Qiskit** *Code Here* *Summer 2020*
  Maths and Physics Club, IIT Bombay *IIT Bombay*
  - Learned the basics of **Quantum Computation** and **Quantum Physics**.
  - Implemented various Quantum algorithms such as **Quantum Teleportation, Universality, Deutsch Josza Algorithm, Grover's Algorithm, IBM's BB84 Protocol** and **Quantum Fourier Transform** with IBM's **Qiskit**.

- **Private Computation Using Cryptographic Primitives** *Code Here* *Summer 2020*
  Institute Summer Project *IIT Kanpur*
  - Implemented **Distributed Point Function (DPF) library** using the principles of **Function Secret Sharing (FSS)** in Rust Programming Language.
  - Learned about various Cryptographic Primitives used for **Private Computation** like **Function Secret Sharing**, **Fully Homomorphic Encryption**, **Yao's Garbled Circuits** and **Shamir's Secret Sharing**.
  - Learned about **Multithreading, Memory Optimizations, Ownership Laws** in Rust language.
  - Used various libraries like **gtest, grpc, google/benchmark** for making tests and benchmarking final code.

- **InfoSec IITK** *Jan2020-April2020*
  Association of Computing Activities, IITK *IIT Kanpur*
  - Learned about techniques like **SQL injections, CSRF attacks, XSS attacks, Binary exploitation, Reverse Engineering** and **Steganography** and tried hands on various sandboxes and crackmes along the way.
  - Learned about **Assembly Language** for **Reverse Engineering Challenges** and how the program actually runs under the hood by studying the use of **Registers** and **Function Stacks**.
  - Took part in various **CTF Competitions** and tried some Old Competitions as part of practise.

TECHNICAL SKILLS

- **Programming & Scripting Languages:** C++, C, Python, JavaScript, Rust, Bash
- **Tools/Technologies:** NumPy, Pandas, LaTeX , Cutter, IDA, Git, LibreCAD, Tensorflow, Gambit, Markdown
- **Machine Learning:** Classification, Neural Networks, CNN, RNN
- **Development:** HTML, CSS, Bootstrap, JavaScript, NodeJS(Proficient), Django(Familiar), PostgreSQL

KEY COURSED UNDERTAKEN

- **Computer Science:** Fundamentals of Programming+Lab, Data Structures and Algorithms*, Mathematics for Computer Science-I*, Game Theory and Mechanism Design*
- **Mathematics and others:** Real Analysis, Linear Algebra, Introduction to Electronics*

(*) - To be completed by Nov 2020

POSITION OF RESPONSIBILITY

- **Secretary, Programming Club** *May2020-Ongoing*
  Programming Club, IIT Kanpur *IIT Kanpur*
  - Helped in conduction of **Deep Learning Hackathons** on various domains and helping students by providing related materials.
  - Responsible for managing Competitive Programming Competition for students of the institute for a month.

EXTRACURRICULARS

- Successfully Completed around 40 hours of Classical Music Training under the Compulsory Cultural Activity (CCA), IIT Kanpur.