Dinanshu Biswas

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Education

RV College Of Engineering — Bengaluru, India
B.E. in Electronics and Communication Engineering; ***CGPA: 7.83*** — *Aug 2019 - Jun 2023 (Expected)*

Apeejay School, Park Street — Kolkata, Bengaluru
CBSE; ***CGPA: 8.5/10*** — *Aug 2017 - Apr 2019*

Research Experience

Tata Institute Of Fundamental Research (TIFR) — Bengaluru, Karnataka
Summer Intern, Apprentice — *May 2020 - Aug 2020*

- Worked in the High Energy Physics Dept and conducted research on the topic of Dirac equation in space-time dependent external electromagnetic fields. During my apprenticeship, I worked closely with a team of researchers to investigate the behavior of electrons in the presence of time-varying electromagnetic fields.
- Used a combination of analytical techniques and numerical simulations, including the finite-difference time-domain method and the split-operator method.Analyzed the results of our simulations to gain insights into the behavior of electrons in these complex environments, and to investigate the impact of various parameters such as field strength and pulse duration.
- Observed the emergence of non-trivial topological properties in the electron wavefunction, which have important implications for a range of physical systems, such as the dynamics of topological materials and the generation of high-energy particle beams.

Work Experience

Ethotech Solutions — Bengaluru, Karnataka
Cybersecurity Analyst Intern — *Dec 2021 - Feb 2022*

- Conducted vulnerability assessments and penetration testing on the company's internal networks and web applications, using tools such as Nessus and Burp Suite to identify and exploit security weaknesses.
- Analyzed and interpreted security logs and events using SIEM tools such as Splunk and ArcSight, and provided recommendations to improve the overall security posture.
- Collaborated with the security team to create and update security policies, standards, and procedures based on industry best practices and compliance requirements, such as ISO 27001 and NIST SP 800-53.

Deloitte Digital — Kolkata, West Bengal
Student Trainee, Apprentice — *Jun 2021 - Sept 2021*

- Contributed to the development of web applications, including building user interfaces and implementing backend functionality using technologies such as React and Node.js, as part of the development module.
- Analyzed and interpreted large data sets to extract insights and develop actionable recommendations, using tools such as Excel, Python, and R, as part of the data analysis module.
- Developed expertise in cybersecurity best practices, including conducting security assessments, identifying vulnerabilities, and recommending remediation strategies, as part of the cybersecurity module.
- Gained hands-on experience with forensic technology tools and techniques, such as EnCase and FTK, as part of the forensic technology module.

IIT Bombay, FOSSEE — Kolkata,West Bengal
Full Stack Developer Intern — *Feb 2021 - May 2021*

- As a web development intern at IIT Bombay FOSSEE, I had the opportunity to work on the Drupal 8 content management system. During my internship, I worked on various projects and contributed to the development of Drupal-based websites.
- My primary responsibilities included developing custom Drupal modules, creating and managing content types, building views and blocks, and theming using Twig templates. I also gained hands-on experience in working with various Drupal modules such as Views, Panels, Rules, and CTools to enhance the functionality of the website.

- Throughout the internship, I honed my skills in web development, particularly in Drupal. I gained experience in PHP programming, CSS, HTML, and JavaScript. Moreover, I learned how to work with Git version control and agile project management methodologies.
  Overall, my internship at IIT Bombay's FOSSEE project provided me with a valuable learning experience in web development and equipped me with the necessary skills to excel in my career as a web developer.

Projects

W.A.D.I.T.O.H - A Sound-based Communication Infrastructure | *GitHub* | Youtube Mar 2023 - Present

- Designed and Implemented a sound-based communication infrastructure using Python and its libraries, along with a handheld receiver made up of a Raspberry Pi. The project aimed to create an alternative mode of communication using sound, which could be useful in situations where internet or radio signals are unavailable. Especially in extreme and sensitive military zones including underwater communication, where the current infrastructure cant be provided
- **Key Contributions:**

  1. Conducted extensive research on the current communication infrastructure for military and underwater zones.

  2. Developed a solution for the transfer of multimedia data over sound instead of radio signals, which consumes less energy, power consumption and can be implemented on existing hardware, as it only requires a speaker and a microphone, while also being secure

  3. Currently designing a User-Friendly interface for a chat and a payments app, which would allow their functionalities to consumers in remote regions

  5. Utilized Python libraries such as NumPy and SciPy to encode multimedia data into sound signals, which could then be transmitted over the air using simple speaker and microphone setups. We also developed a handheld receiver using a Raspberry Pi, which could receive and decode the sound signals and display the multimedia data on a connected screen.

NLP Chatbot for Skype Q and A Analysis | *GitHub* | Youtube Oct 2022 - Dec 2022

- As part of a team project, we designed and implemented an NLP bot that could analyze conversational data between teachers and students on Skype, and print out the answers to frequently asked questions. The project aimed to reduce the workload on teachers by automating the process of answering repeated questions, while also providing students with quick and accurate responses.
- **Key Contributions:**

  1. We used natural language processing (NLP) techniques and algorithms such as named entity recognition, part-of-speech tagging, and sentiment analysis to analyze the conversational data and identify frequently asked questions.

  2. We also developed a backend system using Python and libraries such as NLTK, spaCy, and Gensim, along with CSS, HTML, C++, and JavaScript for the front-end design of the application. Dockerfile was used for containerization and deployment, and Vercel was used for development and hosting.

  3. During the project, I worked on the development of the NLP algorithms and the backend system using Python. I utilized machine learning techniques such as random forests and neural networks to improve the accuracy of the chatbot's responses.

  4. I also collaborated with other team members to design the user interface and integrate the front-end and backend systems. Additionally, I was responsible for optimizing the performance of the NLP algorithms, and testing the overall system to ensure it was efficient and reliable.

Blockchain-Powered Dapp for MSME Businesses. | *GitHub* | Youtube Jun 2022 - Aug 2022

- As part of a team project, we designed and implemented designed and developed a Dapp that generates a token or a cryptocurrency exclusive to the business, which can be used to raise an initial coin offering (ICO).
- **Key Contributions:**
  1. Utilized CSS, SCSS, HTML, C++, JavaScript, and Dart for the frontend development, ensuring a responsive and user-friendly interface.

  2. Built a decentralized backend system using technologies such as Ganache, Truffle, web3.js, Open-zeppelin, Metamask, Node, and Angular.

  3. Implemented smart contracts to handle the generation, transfer, and storage of the generated token

  4. Tested and deployed the Dapp on the Ethereum network, ensuring its scalability and security.

  5. Conducted a comprehensive analysis of the business requirements, ensuring that the Dapp fulfills the needs of MSME businesses.

Awards & Achievements

* Ranked in the **top 1%**by securing **962nd** position among 150,000 candidates in the **GATE ECE 2022** exam on the first attempt. Met the admission criteria for IIT Bombay's prestigious Electrical Department and successfully secured a position in IOCL's highly competitive instrumentation division.
* Secured **5th** position in **Hack-A-Thon + Jobathon 3.0** organised by **iNeuron** among **175 teams**
* Secured a position for Student Project Programme (SPP) from the Karnataka State Council for Science and Technology(KSCST)

Skills

Programming: Python , Flask, Django, JavaScript , MySQL, MongoDB, React, Node.js, Express.js, Embedded C, VHDL

Technologies: Git, Cadence, Xilinx ISE, µVision IDE - Keil

Languages: Bengali (Native), English (Professional), Hindi(Professional), Japanese (Elementary)

Courses

DSA Courses: I completed a DSA course on GeekForGeeks where I solved over 400 problems and gained a thorough understanding of commonly used data structures, including arrays, linked lists, trees, and graphs, and learned how to implement them in various programming languages. Additionally, I practiced problem-solving skills through hands-on assignments and algorithmic challenges, which helped me gain experience in writing efficient and optimized code.

WebDev Courses: I completed two web development courses from Angela Yu and FreeCodeCamp, where I learned the fundamentals of HTML, CSS, and JavaScript, including responsive design principles, CSS layout techniques, and DOM manipulation. Additionally, I gained knowledge in post-production deployment, including building RESTful APIs and connecting to databases. Throughout the courses, I completed several independent projects, including a full-stack web application using the MERN (MongoDB, Express.js, React, Node.js) stack.
ML and AI Courses: Completed an online Machine Learning and Artificial Intelligence course, gaining proficiency in Python programming and popular libraries for data preprocessing, visualization, and machine learning algorithms. Developed hands-on experience building predictive models using frameworks like TensorFlow and Keras, optimizing model performance, and creating deep learning models for image classification and recommendation systems. Completed several independent projects and assignments, demonstrating strong problem-solving and analytical skills and the ability to work effectively with team members and stakeholders.