Dinanshu Biswas

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WORK EXPERIENCE

HP (Freelance)   Bengaluru, Karnataka, India
Product Manager   *Apr 2023 - Jun 2023*

- Developed a scalable **MERN** stack web application for **HP** to analyze customer sentiment from social media. The **application processed 10,000 posts daily**, utilizing APIs from platforms like **Twitter (v2 API) and Facebook Graph API.**
- Implemented Natural Language Processing (**NLP**) techniques (e.g., Named Entity Recognition for identifying product mentions) to pre-process data, achieving a high degree of **accuracy (92%)** in sentiment analysis using pre-trained sentiment analysis models.
- Designed a user-friendly **React.js** frontend with insightful data visualizations (e.g., interactive charts for sentiment distribution across product lines), empowering HP to identify a significantly **higher percentage (50%) of customer pain points**, ultimately leading to improved product satisfaction.

IIT Bombay Research Park Foundation-ASPIRE   Bengaluru, Karnataka
QT Developer   *Feb 2022 - Mar 2023*

- **Lead the development** of the Virtual Tour Application for IIT Bombay, overseeing the entire **lifecycle** from concept to deployment.
- Developed and optimized application features: Implemented support for immersive 360-degree videos, developed an intuitive user interface with interactive elements using Qt's graphical tools, and managed backend components for **tour metadata, user authentication, and database integration** using **Qt's SQL module**. Ensured compatibility across desktop computers, mobile devices, and VR headsets.
- Enhanced performance and quality: Conducted performance optimization to i**mprove responsiveness and minimize loading times**. Executed rigorous testing to identify and **address bugs**, ensuring high quality and performance standards. Prepared technical documentation and training materials for deployment and **user onboarding**.

Ethotech Solutions   Bengaluru, Karnataka
Application Security Admin   *Dec 2021 - Feb 2022*

- Conducted comprehensive **VAPT** on internal networks and web applications, identifying and exploiting critical vulnerabilities (e.g., SQL injection, XSS) that **reduced** potential security incidents by **50%**.
- Leveraged **SIEM** tools (Splunk, ArcSight) to **analyze 1,000 security logs** daily, proactively identifying and mitigating potential threats, leading to a **40% decrease** in security breaches.
- Collaborated with the security team to create and update security policies, standards, and procedures based on **ISO 27001 and NIST SP 800-53**, achieving a **98% compliance rate**.

Deloitte Digital   Kolkata, West Bengal
Cybersecurity Intern   *Jun 2021 - Sept 2021*

- Employed industry-standard methodologies (**OWASP Top 10**) to perform security assessments on a portfolio of **15 critical systems** (including **Windows Server 2019**, **Ubuntu 20.04**), successfully remediating **25 high-risk** vulnerabilities (e.g., **CVE-2021-34527**).
- Utilized forensic tools (**EnCase, FTK**) to investigate 10 security incidents, extracting crucial evidence and contributing to an **85% resolution rate**.
- Analyzed large datasets using Python and R, extracting actionable insights that **improved decision-making** processes by **20%.**

IIT Bombay, FOSSEE   Kolkata, West Bengal
Web Development Intern   *Feb 2021 - May 2021*

- Developed **10 custom Drupal modules** leveraging advanced features (Views, Panels, Rules, CTools) to **improve** website **functionality** metrics by **35% (e.g., page load speed, user engagement**).
- Built user interfaces and **implemented backend functionality** for a complex web application consisting of **50 interlinked web pages** using HTML5, CSS3, and modern JavaScript frameworks (React.js for dynamic components).
- Worked with **Git version control** and **agile** project management methodologies, **reducing** development **cycle times by 15%.**

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.

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

* Secured an **All India Rank (AIR)** of **251** in the **GATE ECE 2024**, demonstrating top-tier performance in the exam.
* Ranked in the **top 1%** by achieving **962nd** position among 100,000 candidates in the **GATE ECE 2022** exam on the first attempt. This accomplishment met the admission criteria for **IIT Bombay** and secured a position in **IOCL**'s competitive **instrumentation division**.
* Achieved **5th place** in **Hack-A-Thon + Jobathon 3.0** organized by **iNeuron**, competing against **175 teams**.

* Received a position in the **Student Project Programme (SPP)** from the Karnataka State Council for Science and Technology (KSCST), highlighting project excellence and innovation.

Education

RV College Of Engineering   Bengaluru, India
*B.E. in Electronics and Communication Engineering; **CGPA: 8.83***   *Graduated*

Skills

Programming: Python, JavaScript, TypeScript, HTML5, CSS3, SQL, NoSQL, C++, Dart, Flask, Django, Embedded C, VHDL

Technologies: Node.js, React, Next.js, Docker, Kubernetes, Terraform, Git, CI/CD (GitHub Actions), Prometheus, Grafana, Splunk, AWS, GCP, ECS, Helm, Docker Compose, Docker Swarm

Backend Development: Express.js, RESTful APIs, GraphQL, ORM (Sequelize, TypeORM), Redis, Kafka, Microservices, Serverless Framework

DevOps: Linux/Bash Scripting, Containerization (Docker, ECR, ACR), CI/CD Pipelines (Jenkins, CircleCI, GitLab CI/CD), Infrastructure as Code (Terraform), Monitoring and Logging (Prometheus, Grafana, Datadog, New Relic), Package Management (Helm), Cloud Platforms (AWS, GCP, ECS, K8S - Tanzu, OpenShift)

Database Management: SQL (PostgreSQL, MySQL, DB2), NoSQL (MongoDB, Redis, Neo4j, Cassandra, DynamoDB), Database Scaling and Optimization

Backend Frameworks: NUXT, NEXT, NEST, FASTIFY, EXPRESS

ORM: PRISMA, DJANGO ORM, SQLZ

CI/CD Tools: Jenkins, CircleCI, GCP DevOps, GitLab CI/CD

Containerization: Docker, ECR, ACR

Orchestration: Docker Compose, Swarm, ECS, K8S (Tanzu, OpenShift)

Testing: Cypress, Swagger, Playwright

Issue Tracking: JIRA, Asana, Notion

Monitoring: Datadog, Prometheus, Grafana, New Relic

Servers: Caddy, NGINX, IIS

CDN: Akamai, CloudFront, GCP CDN

Communication Protocols: REST, gRPC, SOAP, Webhooks, JSONRPC, GraphQL, Websockets

Source Control: Git, Bitbucket

Miscellaneous: Redis, Pub/Sub, SurrealDB, Memcached, Elasticsearch, Firebase