Vamshikiran Morlawar

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Education

Year	Degree/Certificate	Institute	CPI/%
2022-Present	M.Tech/Computer Science & Engg.	Indian Institute of Technology, Kanpur	8.86/10
2016-2020	B.E/Information Technology	International Institute of Information Technology, Pune	9.28/10
2016	HSC(XII)	Rashtramata Indira Gandhi College, Jalna	79.85%
2014	SSC(X)	Shri MS Jain English School, Jalna	96.60%

Experience

- **Pepsico India** - Intern (*Jun'23 - Aug'23*)
  - Developed a system to visualize Pepsico's employee organizational structure across different hierarchical levels
  - **Applied insights from coursework in Big Data Visual Analytics**, effectively translating concepts into an impactful solution
  - Collaborated with cross-functional teams, delivered the project within the timeframe, and received positive feedback
- **Innocean Worldwide Europe, Germany** - Web Developer (*Jun'22 - Aug'22*)
  - **Collaborated with major brands Hyundai and Kia** to elevate design and user interaction through dynamic web modules
  - Built an interactive slider and questionnaire module enhancing **Hyundai's flagship Brand 3.0 Page**
  - Created a module letting users easily explore different car models for **Kia's Range Campaign Landing Page**
- **Techverito Software Solutions, Pune** - Consultant (*Aug'20 - Mar'22*)
  - **Crafted a niche as a versatile Full Stack Developer**, dedicating efforts to both internal projects and client-centric solutions
  - Harnessed the power of comprehensive training to excel in **writing clean code** and **master Agile methodologies**
  - Played a key role in the successful revamp for a Canadian insurance client's website within a 3-month timeframe
  - **Earned recognition** from the client's manager for outstanding work, leading to positive feedback

Thesis

- **Feature-Rich Research Platform with Infrastructure Optimization** (M.Tech Thesis) (*Mar'23 - Present*)
  Guide: Prof. Arnab Bhattacharya
  - Designing a platform hosting content in multiple languages, ensuring users can contribute and access content seamlessly
  - Developing to **handle high traffic loads efficiently**, ensuring optimal performance even during peak usage
  - Planned integration of **AI/ML** to enhance content discovery and assist writers in generating high-quality content
  - Developing the project as **an open-source initiative**, encouraging contributions, and fostering collaborative development

Projects

- **Blockchain-based Recruitment Management System** (CS731A) | Prof. Angshuman Karmakar (*Jan'23 - Apr'23*)
  - Developed a **decentralized application with Solidity smart contracts** at core, driving the functionalities on the blockchain
  - Crafted a user-friendly interface using ReactJS and engineered the backend infrastructure utilizing Express and NodeJS
  - Achieved **exceptional score of 110 out of 100**, including bonus points, for the project's impeccable execution
- **Insights into Customer Behavior and Business Strategies for Restaurant** (CS661A) | Prof. Soumya Dutta (*Jan'23 - Apr'23*)
  - Effectively utilized the Zomato Restaurants dataset to complete a project focusing on Visual Analytics
  - Translated **complex data into insightful visual representations**, including Bar Charts, Line Charts, Heatmaps, and Trees
  - Identified popular cuisines and performed customer segmentation, driving tailored strategies for businesses
- **Big Data Visual Analytics** (CS661A) | Prof. Soumya Dutta (*Jan'23 - Apr'23*)
  - Processed 2D uniform grid data in VtkImageData format, extracting cell details and visualizing them
  - **Executed advanced volume rendering** with Phong Shading after extracting 2D isocontours
  - Developed an interactive platform using Plotly and Jupyter Widgets for dynamic isosurface visualization and histogram analysis with real-time user adjustments
  - **Implemented random sampling** on volume data and reconstructed volume data from sampled points
- **Escaping Caves** (CS641A) | Prof. Manindra Agrawal (*Jan'23 - Apr'23*)
  - Analysed cryptosystems like Substitution Cipher, Vignere Cipher, Substitution-Permutation Cipher, DES, EAEAE and AES
  - Employed cryptanalysis techniques like Frequency Analysis, Differential Cryptanalysis, and Brute Force
- **Captcha Solver** (CS771A) | Prof. Purushottam Kar (*Aug'22 - Nov'22*)
  - Utilized **HSV model** to improve CAPTCHA text character detection by identifying background pixels in the image dataset
  - Implemented brightness-based thresholding for precise character-background separation to segment individual character
  - **Achieved 100% accuracy** in character classification by **training a multiclass SVM model** using flattened image data
- **The Code Corrector** (CS771A) | Prof. Purushottam Kar (*Aug'22 - Nov'22*)
  - Implemented dataset balancing techniques, such as SMOTE, to address data imbalance and detect code errors
  - Applied **classification methods**, including One-vs-All, Decision Tree resulting in improved program repair efficiency
- **Hand Sign Recognition and Mouse Control using Hand Gestures** (CS724A) | Prof. Amitangshu Pal (*Aug'22 - Nov'22*)
  - Designed a comprehensive module that **translates sign language into text and speech formats** with 95.7% accuracy
  - Developed an HCI system using Computer Vision and ML, allowing **real-time cursor control via hand gestures**
- **Program Analysis, Verification and Testing** (CS639A) | Prof. Subhajit Roy (*Aug'22 - Nov'22*)
  - **Performed Data Flow Analysis** to generate optimized IR(Intermediate Representation) for a kachua program
  - Developed custom mutation operations for a **fuzzing** framework to maximize kachua program coverage
  - Synthesized unknown constants using **Symbolic Execution** to make two kachua programs semantically equivalent

- Applied **Abstract Interpretation with interval domain** to verify the correctness of the kachua program
- **Strengthening IoT Devices with Hardware Security** (CS666A) | Prof. Urbi Chatterjee (*Aug'22 - Nov'22*)
  - Implemented an Adder/Subtractor, S-Box, and an LFSR using **Verilog**, including module design, test bench, and simulations
  - Developed a code employing **Difference of Mean Attack** to recover bytes of secret key in AES encryption using power traces
  - Implemented **Correlation Power Attack** code to extract target byte from AES-128 last round secret key
  - Executed **Differential Fault Attack** on AES-128 to get 1^{st} column of round 10 key using pairs of faulty & correct ciphertext

SKILLS

- **Languages:** C, C++, Python, Javascript, SQL, PHP, Verilog, Solidity
- **Web Technologies:** HTML, CSS, Bootstrap, React, Vue, Node.js, Next, Rest API
- **Libraries/Utilities/Tools:** Git, Plotly, Matplotlib, OpenCV, Numpy, Pandas, Scikit-learn, vtk, Hardhat, Agile, TDD, Adobe Design Suite, Apache Echarts, ChatGPT, UI/UX

ACHIEVEMENTS

- Secured **All India Rank 343** in GATE CS 2022 out of 77,257 candidates
- Awarded for designing a Logo and Website for the **Indian Knowledge System(IKS) at IIT Kanpur**
- **Google Hashcode** 2021 (Rank 3925)
- **Overall Academic Achievement Award** 2019-20
- **Dr. Sunil Pathak Award** 2019-20
- **Special Technical Category Award** 2019-20
- **Academic Excellence Award** 2018-19 (Third-Year Topper)
- **Runner Up in Wavenigma** CSAM'19 at Symbiosis Centre For Information Technology(SCIT)
- **Infosys Certified Software Programmer** 1922 selected among 62K+ applicants
- **TCS Codevita Season 8** Rank 6226 out of 55,654
- Selected for **Persistent Computing Institute(PCI) Winter School 2018** at Persistent Systems, Pune
- **First Prize in Web Weaver** at Credenz'17 by **Pune Institute of Computing Technology IEEE Student Branch**
- HackerRank Python Basic
- HackerRank Python Intermediate

POSITIONS OF RESPONSIBILITY

- **Teaching Assistant** Mathematics for Computer Science (CS201) (*Aug'23 - Present*)
- **Teaching Assistant** Fundamentals of Computing (ESC111/112) (*Nov'22 - July'23*)
- **Chairperson** at **ACM Student Chapter** and ITSA (*2019-20*)
- Part of **Public Relation (PR) Committee** (*2018-19*)
- Part of **CII Yi Student Net** (*2016-17*)

COURSES

- **Postgraduate**

  Program Analysis, Verification & Testing(CS639A)
  Hardware Security for IoT(CS666A)
  Intro to Machine Learning(CS771A)
  Sensing, Communication & Networking for Smart Wireless Devices(CS724A)
  Big Data Visual Analytics(CS661A)
  Blockchain Technology and Applications(CS731A)
  Modern Cryptology(CS641A)

- **Undergraduate**

  Database Management System
  Operating System
  Problem Solving & OOPS
  Data Structures & Files
  Design Analysis of Algorithm
  Computer Network Technology

COURSES

- **Postgraduate:** Program Analysis, Verification and Testing | Intro to ML | Big Data Visual Analytics | Modern Cryptology | Blockchain Technology and Applications | Hardware Security for IoT | Sensing, Comm & Networking for Smart Wireless Devices
- **Undergraduate:** Problem Solving and OOPS | DBMS | Data Structures and Files | Design Analysis of Algorithm | OS