Shourya Pratap Singh

CS Junior at VIT Chennai

+91 77092 22934 | sp.singh.150604@gmail.com | /amspsingh04 | /amspsingh04 | /vercel

Education

BTech in Computer Science and Engineering | *VIT Chennai* | *October 2022 - July 2026*
CGPA: 8.63/10 (4 semesters)
Class 12, PCM with Informatics Practices | *CBSE* | *The Orbis School, Pune* | *June 2020 - July 2022*
Score: 94.80%
Class 10, Science with Math | *ICSE* | *The Bishop's School, Pune* | *June 2007 - June 2020*
Score: 96.80%

Experience

Machine Learning (ML) Research Intern, National Taiwan University — May 2024 - July 2024

- Interned at **Computational Intelligence** in Biomedical Imaging lab at NTU under Prof. Cheng Ying Chou.
- Engineered an ML model to detect colon cancer from CT Scans, using UNet(Conv Neural Networks) and EffTrans (Transformer), **achieving 91.5% diagnostic accuracy** in detecting colon cancer, **surpassing previous research benchmarks by more than 5%.** Worked with Python, Pytorch, CuDNN and CUDA., and developed a model which could run **inferences 30% faster** than previously recorded, through C++ based CUDA programming.
- Developed auto annotation software for NTU Hospital to use the model for efficient medical decision making, allowing for scalability and deployment to other medical establishments, deployed in a Linux environment.

Publications

A review on rhodamine probes for metal ion recognition with a future on AI and ML
Published in Elsevier - Coordination Chemistry Reviews (Journal IF-24.83) — Paper Link

- Worked in a multi-disciplinary team under the guidance of Dr. Pritam Ghosh on developing a Rhodamine reaction-based ML tool for chemical analysis via **image analysis.** Developed ML model using chemosensing datasets to analyze analytes in unknown specimens. Developed it using Tensorflow and Python based OpenCV, CNN, SVM. Lead regular code reviews and collaborations to integrate various aspects of ML.
- Lead a team of 4 to work on local deployment of the model. Applied Software Engineering principles to maintain code readability and usability, incorporating git. The publication has been cited 19 times since publication.

Projects

AMKR - Assistive Eyewear for the Visually Impaired — *Product*
Tech: Raspberry Pi0, PiCam V3, Text-to-Speech (TTS) API, GPT-4 Vision API, Google TensorFlow Lite(TFLite), Microsoft Azure

- **Designed eyewear** to assist the blind with reading text, recognizing faces, and scene perception.
- Pitched to VNEST (VIT Start-up Incubator) and **secured seed funding** to help scale the product. The product was ADA-compliant and and can be used to assist the 100% blind as per our usecases.
- Utilized Generative AI tools such as Meta NougatOCR and GPT-4 Vision API for to enhance optical character recognition; OpenAI Text-to-Speech (TTS) for auditory feedback; Google TensorFlow Lite(TFLite) for face recognition.

Nyaya - Sahaya — *Winning project - VITISH 23, intra VIT hackathon*
Tech: Flutter, Firebase — GitHub Link

- Developed an intuitive software enhancing accessibility for users within legal system. **Demoed at Google Build with AI in Bangalore** along with my team of 2, demoing our Generative AI capabilities.
- Leveraged Firebase's real-time database with SSL encryption and integrated OAuth 2.0 for secure user authentication to ensure robust data protection and privacy of legal documents. Increased legal documentation processing efficiency by 85%, enabling lawyers and court officials to handle cases 50% faster compared to traditional methods.

hostelHub — *Winning project - VNEST Solvathon '23*
Tech: Flutter, Firebase, TensorFlow, PaLM V2, GCP, MakerSuite — GitHub Link

- Created a versatile mobile application designed to streamline hostel management processes. Provides **70% better database network latency** than currently used systems. Deployed **Database level algorithms** for searching, indexing, and querying, increasing efficiency.
- Developed the **AI based facial recognition** feature to obtain about 97% accuracy when interfacing with registered users. Automates the management level tasks to reduce paperwork by 80%, is easily scalable since it has a simple architecture.

DSA Solver — *Course project - Fall Semester '23*
Tech: Flutter, Firebase, Pytorch, Google Cloud, Python, Kubernetes, Google Cloud Platform

- Developed a Micro Language Model focused on learning from Leetcode questions, editorials, and solutions across various problem categories. Integrated generative AI capabilities using a locally hosted MicroLM, emphasizing efficiency in smaller-scale systems. Constructed a 2 million parameter model capable of functioning effectively without GPU support, designed to operate in resource-constrained environments.
- Implemented the model using distributed computing techniques (Kubernetes and Google Cloud) to optimize processing and reduce operational latency. Utilized Google Cloud services to manage data distribution and processing tasks, ensuring high availability and scalability.

Positions of Responsibility

Research Lead, Dr. Ibrahim Research Group, DSC VIT Chennai

- Student Lead of the Dr. Syed Ibrahim Research Group, leading a team of 15 student researchers, primarily working on medical image segmentation, computer vision, federated learning and few shot learning.
- Currently leading the Research Group for Capsule Vision Challenge 2024, leading a cohort of 4 members, working with QWEN-2-VL 7B and YOLO models to work on Capsule Video Endoscopy and diagnose gastrointestinal conditions within patients. Also, working with SWIN-UNet model.
- Leading the Research Group for IndoML 2024, an NLP competition.
- Set up a Linux server and maintained a CI/CD pipeline to ensure seamless integration of work done by research group members into final product.

Student Chair, Campus Development Committee, VIT Chennai

- Leading a team of 6 students in a digital transformation initiative for campus facilities, impacting over 5000 students and increasing administrative efficiency by 30%

Head of Finance, DevsHouse '24, VIT Chennai

- Lead the finance team, ensuring proper budgeting and accounting for the flagship event of GDSC VIT Chennai, working with a budget of Rs 1.5 Lakhs.

Skills

- Have worked with Pytorch, Tensorflow, Linux, CUDA, CUDnn, Python, C++.
- Experienced with working on Transformers, CNNs, UNets, ANNs, and RNNs,
- Python and C++ for ML and Computer Vision; Flutter, React Native, and Firebase for app development; Node for backend; AJAX (Async Javascript Transfer) for UI development; HTML5, CSS, JS, React for Web dev.
- Heroku and Google Cloud Platform to host projects and products developed. Worked with Linux systems as well. Worked with Kubernetes for distributed systems. Experienced with Cisco Packet Tracer and networks programming (TCP/IP).
- Experience with Jupyter, and data analysis tools like Power BI, Tableau and R for Data science and data analytics. Used Scikit Learn for data mining and SQL for managing RDBMS.
- Certified in networks programming by Cisco and Cloud computing by Google.

Achievements

- Google Build with AI, Bangalore Project Demonstration - 2024
- 2x VNEST - Intra VIT Hackathon winner - 2023
- IEEE YESIST12 Bangalore section winner - 2023
- Top 15 - CyberX Hackathon, Greater Chennai Police - 2023
- Times NIE, Star Correspondent, Pune 2018-2022. Part of Google Cloud Career Practitioner '22

Relevant Coursework

- Programming Languages: Python, C, C++, Java, R*
- Mathematics: Calculus, Differential Equations and Transforms, Discrete Mathematics, Complex Variables and Linear Algebra, Probability and Statistics*
- Core CS: Data Structures and Algorithms (C++), Design and Analysis of Algorithms*, Operating Systems(Linux), Computer Architecture and Organisation, Web Development (HTML, CSS, JS), Computer Networks, Theory of Computation, Database Systems (Oracle SQL, MySQL, MongoDB in NoSQL), Software Engineering*, AWS Solutions Architect*
- Specialisation: Microprocessors and Microcontrollers, Signals and Systems (Signal processing), Human Computer Interaction*
- Basics: Engineering Chemistry, Engineering Physics, English, Spanish

* - Ongoing courses in Jul-Dec 2024

Key interest areas

- Software Engineering, Product and Systems Development
- Artificial Intelligence and Machine Learning (AI/ML) with Data Science
- Computer Vision
- Biomedical Research