Sumedh. A. Sonawane
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EDUCATION:

Indiana University, Indianapolis
M.S. in Applied Data Science | GPA: 3.75/4 | Aug 2023 – May 2025
Savitribai Phule Pune University, Pune
Bachelor of Engineering in Computer Engineering | GPA: 7.97/10 | June 2018-May 2022

Work /Internship Experience:

Software Developer – The Polis Center at Indiana University *(Aug 2024 – Dec2024)*
- Led the **backend revamp** of a key application, improving system efficiency and performance.
- **Developed** and **optimized APIs** to enhance data accessibility and streamline application functionality.
- Worked closely with stakeholders to align technical improvements with user requirements.

Research Assistant – Aimed Lab, Indiana University *(Aug 2024 – Present)*
- Conducted research in AI-driven medical imaging under the mentorship of **Prof. Rakesh Shiradkar,** expanding expertise in deep learning applications for healthcare.
- Investigated advanced deep learning techniques, including **CNN-based architectures**, **transformer models**, and **segmentation frameworks,** to enhance **medical image analysis**.
- Worked with multi-modal imaging data, applying machine learning methodologies to extract meaningful insights for clinical applications.

Research Assistant -Luddy School of Informatics Computing and Engineering   Aug 2023-Present
- **Enhanced NLU and Large Language Models**: Led the end-to-end AI chatbot project using Bot press, executed finetuning techniques and rationality checks, improving chatbot performance and user interaction at Indiana University.

Projects:

Backend Revamp & Feature Enhancement for a Web Application *(Confidential Project – The Polis Center at Indiana University)*
- **Problem:** The application required a backend overhaul to improve **performance, scalability, and functionality**.
- **Solution:** Led the **backend revamp**, optimizing **system architecture, database queries, and API endpoints** to enhance efficiency and responsiveness.
- **Enhancements:** Added **new functionalities** to improve user experience, data accessibility, and application interactivity.
- **Impact:** Enhanced system **stability and performance**, ensuring seamless integration with existing services while maintaining compliance with security and operational standards.

Patient Notes Summarization with T5 and Streamlit:
- Problem: Healthcare providers often struggle to quickly review lengthy patient histories, which can be up to 10,000 characters long, leading to inefficiencies in patient care and decision-making.
- Action: Developed a Streamlit-based application utilizing a fine-tuned T5 model that reduces patient notes to concise summaries of approximately 150 characters, processing over 1,000 patient records in under 10 minutes.
- Result: Achieved a 40% reduction in review time for healthcare providers, with the model generating summaries that were rated as 85% accurate compared to manually written summaries in a validation set of 500 records.

Brain Tumor Detection using CNN (Team of 4)
- Problem: Inaccuracies in brain tumor detection from MRI data.
- Action: Utilized image processing techniques and a CNN to segment brain MRI data.
- Result: Achieved 90% accuracy in predicting the presence of brain tumor, improving diagnostic capabilities.

Research Papers:
- "Improved Genetic Optimized Feature Selection for Online Sequential Extreme Learning Machine" Journal - Ingénierie des Systèmes d'Information
- "Smart Farm: Agriculture System for Farmers using IoT" Journal - Ingénierie des Systèmes d'Information.

Technical Skills:
- **Programming Languages:** Python, R, C++
- **Machine learning :**Pytorch, TensorFlow, scikit-learn, SVM, CNN, RNN
- **Medical Image Segmentation:** nnU-Net, 3D U-Net, MedSAM, DynUNet (MONAI)
- **NLP-** BERT, T5, ChatGPT-4.0, SAM2
- **Data Analysis**: Pandas, NumPy, Matplotlib, Seaborn, EDA, Statistical Analysis
- **Data Visualization Tools:** Tableau, Power Bi
- **Database Management:** MySQL, SQL, Excel •
- **Tools:** Jupyter Notebook, Anaconda, RStudio

Certifications:
- Data Science with Python-Technogeeks-DSPC-1727
- Deep Learning & Computer Vision in Image & Video Analysis-E-cell, IIT Hyderabad

Activities:
- College football team captain: Demonstrated leadership and teamwork skills.
- Inter-college football tournament coordinator: Highlighted organizational and communication skills.
- Pune ploggers volunteer: Showcases environmental awareness and community engagement