PREDNYA RAMESH RAMESH KUMAR

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Graduate student at UPenn with hands-on experience in full-stack development, scalable microservices, and building ML pipelines and models. Eager to design and deploy production-ready systems that solve complex, real-world challenges across domains. Passionate about learning, innovating, and contributing to teams that value technical depth, collaboration, and continuous growth.

EDUCATION

University of Pennsylvania, Philadelphia, PA *August 2024 – May 2026*
MS, Computer Science

PSG College of Technology, Tamil Nadu, India *October 2020 – April 2024*
B.E, Computer Science

WORK EXPERIENCE

University of Pennsylvania, Philadelphia, PA *February 2025 – Present*
Research Assistant

- Optimized **Python** data pipelines using **Scrapy** and **PyMongo** to automate the processing of **10K+** multilingual think tank publications, **reducing manual effort by 90%**.
- Integrated language detection and text cleaning to prepare high-quality data for NLP and regression models.
- Managed structured datasets across **MongoDB** collections, improving scalability and **accelerating research workflows by 20%**.

Intel Corporation, Bengaluru, Karnataka, India *January 2024 – May 2024*
Software Development Intern

- Automated **CI/CD pipelines** to improve deployment speed, reduce errors, and increase **productivity by 25%**.
- Containerized an **Angular-Flask dashboard** and streamlined deployment using **Docker, Kubernetes, and Rancher**.
- Created new and validated existing **Jasmine/Karma unit tests**, achieving **350+** passing cases and ensuring better performance.

Microsoft, Hyderabad, Telangana, India *May 2023 – June 2023*
Azure Cloud Intern

- Built a Warehouse Management System using **Angular** and **.NET**, integrating **Kafka** for real-time data streaming and **PowerBI** dashboards to visualize profit and loss metrics.
- Replicated virtual machine images across regions using **Azure CLI** to ensure disaster recovery and support scalability.
- Designed a **DASH**-based decision framework by aligning forecasted and actual values to **reduce deviation charges by 15%**.

TECHNICAL SKILLS

Languages: Python, Java, C, C++
Web Frameworks & Testing: React, Angular, JavaScript, TypeScript, HTML CSS, Jasmine, Karma
Backend & Databases: Flask, Node.js, .NET, Scrapy, SQL, PostgreSQL, MongoDB, MySQL
Cloud & DevOps: AWS (EC2, S3), Microsoft Azure, Docker, Kubernetes, CI/CD, Git
Machine Learning, Visualization & Analytics: Pandas, NumPy, Scikit-learn, TensorFlow, PyTorch, OpenCV, PowerBI, Tableau

PROJECTS

Cross-Lingual Code-Mixed Summarization with Curriculum Learning:

- Developed **CSCL** framework enabling a **3B** model to outperform **GPT-4.1 (1T+ params)** by **68%** on multilingual summarization, training on 2,584 samples on a single GPU.
- Achieved **50% improvement** over GPT-4.1 on **zero-shot Hindi-English**, trained only on Mandarin/Malay/Tamil-English.

Personality Trait Analysis: [Link – IEEE Paper]

- Implemented a multimodal model integrating **BERT** (text), **MFCC+CNN** (audio), and **CNN** (video) for Big Five personality trait prediction, achieving **80% accuracy**.

Securing Authenticity In The Digital World: A Microservices Approach To Deepfake Detection:

- Built scalable microservice for real-time deepfake detection in videos and images using ML and image processing, **achieving 84%** accuracy with **continuous learning** for model improvement, designed for scalable integration into digital platforms.

PATENT

Cloud-Based IoT Stress Detection System Using Physiological Data and Machine Learning Approach: *April 2024*

- Designed real-time stress detection system combining adaptive **Kalman filtering** (**15dB SNR improvement, 70% fewer false positives**) with privacy-preserving **federated learning** across wearable devices.