Narendra Rane

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EDUCATION

University of Maryland — College Park, MD
MS, Applied Machine Learning, **GPA: 3.79** — Expected May. 2026

Smt. Kashibai Navale College of Engineering (Pune University) — Pune, India
B.E. Computer Engineering — Aug. 2017 - May. 2021

PROJECTS

- **Dual-Mode RAG System for Research Paper QA:** Oct. 2025 - Dec. 2025
  - Designed a **dual-mode RAG system** (text-only vs. structured multimodal) for PDF question answering using FastAPI, Qdrant, Sentence Transformers, and LLaMA-3.3-70B.
  - Improved answer quality over a No-RAG baseline by **+47.7% keyword overlap** and **+24.5% faithfulness**, demonstrating the impact of retrieval-augmented generation.
  - Implemented **structured PDF parsing and semantic chunking**, improving **conceptual query retrieval by up to +8.3% keyword overlap** while preserving citation-grounded outputs.
- **AU-Conditioned MAE + Pose-Normalized Facial Expression Recognition:** Oct. 2025 - Dec. 2025
  - Designed a **hybrid FER framework** combining **AU-conditioned self-supervised MAE pretraining** with **pose normalization**, evaluated on **RAF-DB (7 classes)** under in-the-wild pose variation.
  - Implemented an **AU-Conditioned ViT-MAE**, injecting Action Units via **token conditioning and FiLM-based feature modulation**, and achieved **83.67% accuracy / 75.49% Macro-F1** with a supervised FER baseline.
  - Performed ablations showing pose normalization reduced accuracy to **80.28%** and **AU-MAE transfer limits (71.79% accuracy)** due to dataset scale and AU noise.
- **PreGest: Real-Time Gesture Recognition for VR:** Oct. 2025 - Dec. 2025
  - Developed a CNN–Transformer gesture recognition system for Meta Quest 3, achieving **94.14% accuracy** with **79 ms latency** in real-time VR environments.
  - Designed a multi-modal architecture combining RGB features and hand segmentation masks, outperforming 3D CNN baselines with **2.6× faster inference**.
  - Built a full ML pipeline from dataset creation (671 videos) to ONNX deployment and edge optimization.

WORK EXPERIENCE

Winspire Solutions Pvt. Ltd — Pune, India
Microsoft Nav Technical Consultant — May. 2021 – Sept. 2022

- Enhanced system performance by **30%** by optimizing legacy code, resulting in a **15% improvement in operational efficiency** and **10% increase in client profitability**.
- Delivered **10+ full-cycle ERP projects** using **Microsoft Dynamics NAV** and **Business Central**, achieving **100% on-time delivery** and exceeding client expectations in **90% of cases**.
- Resolved **50+ high-priority issues**, reducing average resolution time by **40%**, and implemented scalable fixes that cut long-term support costs by **20%**.

TECHNICAL SKILLS

▪ Programming Languages: **Python, JavaScript, C++, SQL, R, MongoDB, SQLite**
▪ Machine Learning & AI: **Supervised & Unsupervised Learning, Deep Learning, Neural Networks, Hypothesis Testing, Scikit-learn, SciPy**
▪ Data Science & Analytics: **Data Collection, Data Cleaning, Data Mining, Data Visualization, Pandas, NumPy, Matplotlib, Seaborn**
▪ Tools & Platforms: **Jupyter Notebook, Google Colab, Docker, Git, Excel, Linux**
▪ Techniques: **Predictive Modeling, Statistical Modeling, Natural Language Processing (NLP), Artificial Intelligence (AI), Computer Vision**

CERTIFICATION

- **Microsoft Certification** of *Introduction to Programming* using **Python** — Jan. 2021