ADITYA PACHPANDE

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Education

Purdue University **May 2027**
Bachelor of Science in Computer Science, Data Science *West Lafayette, Indiana*

Technical Skills

Languages: Python, R, SQL (MySQL, PostgreSQL), Julia, Scala, MATLAB, Java, C++
ML/AI Tools: PyTorch, TensorFlow, Scikit-learn, Keras, Pandas, NumPy, SciPy, NLTK, SpaCy, HuggingFace
DataSpark, Kafka, GCP, BigQuery

Experience

Trauma THOMPSON, an AI Copilot for First Response Medicine **November 2024 - Present**
Machine Learning Undergraduate Researcher *Purdue University, West Lafayette*

- Engineered **YOLOv11** CV models for medical tool detection, achieving **96% mAP@[0.5:0.95]** with **model quantization** and **focal loss** optimization for class imbalance in critical medical datasets.
- Developed **active learning pipeline** with **uncertainty sampling** that reduced data annotation requirements by **80%**, implemented with **PyTorch** and **Ray** for distributed processing.
- Created **mixed reality visualization** system integrating ML inferences on **HoloLens**; contributed statistical analysis and performance optimization sections to research paper using **ablation studies**.

Tech4Change, Bhumi **July 2022 – Jan 2024**
Technical Lead

- Developed **5+ high-impact websites with optimized SEO and payment gateways** for nationwide NGOs.
- Managed **10+ major requests**, collaborating with founders of Aavishkar, WeAreWithYou, and CreativitiCouncil.
- Led technical support and **mentored interns** to drive innovation.

BMek TECH LLP **August 2022 - May 2023**
Machine Learning Engineer Intern

- Engineered **unsupervised clustering algorithms** (**K-means**, **DBSCAN**, **Gaussian Mixture Models**) for customer segmentation, achieving **silhouette score of 0.78**.
- Implemented advanced ML models including **DQN** (reinforcement learning), **gradient boosting**, **random forest**, and **CNN/LSTM architectures** for time-series prediction.
- Developed **stacked ensemble** framework with **meta-learner** optimization, improving prediction accuracy on medical performance data by **18%** over baseline models.

Projects

Spectator AI - Sports Analytics Platform **August 2022 – Present**

- Secured **USD 25000 in Azure credits** and **USD 2500 in OpenAI API** credits; architected scalable ML infrastructure using **Azure ML** and **Docker containers**.
- Implemented **computer vision pipeline** with **YOLOv11** for player tracking with **95% mAP**; built **transformer-based** models with **BERT** fine-tuning for sports content analysis.
- Designed **tactical analysis system** using **Grounding DINO** and **trajectory clustering** algorithms to identify formation patterns and strategic movements.
- Created production ML pipeline with **MLflow** for experiment tracking and **FastAPI** microservices for inference deployment.

Drone Navigation System | *Computer Vision, Reinforcement Learning, Spatial Algorithms* **October 2024**

- Engineered predictive physics model with **probabilistic state estimation** using **Kalman filters**; implemented **spatial partitioning** with **quadtree data structures** for 40% efficiency improvement.
- Optimized object detection with **attention mechanisms** and **model pruning** techniques, achieving **30ms inference time** on edge devices.

Housing Price Prediction Engine | *Regression, Feature Engineering, Ensembles* **October 2022**

- Developed end-to-end ML pipeline with **feature engineering**, **target encoding**, and **dimensionality reduction** using **PCA**; achieved **RMSE of 0.127** on Zillow dataset.
- Implemented **stacked ensemble** combining **RandomForest**, **XGBoost**, and **ElasticNet** models; optimized hyperparameters using **Bayesian search** with **cross-validation**.

Certifications

- Stanford Machine Learning Specialization - Deep Learning, NLP, Computer Vision
- Google Advanced Data Analytics - Statistical Analysis, Machine Learning
- AWS Machine Learning Specialty
- Deep Learning Specialization - Neural Networks, CNNs, RNNs, Transformers
- TensorFlow Developer Certificate - ML Models, Computer Vision, NLP