

ZAKARIA COULIBALY

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PROFESSIONAL SUMMARY

Computer Science professional with proven expertise in Machine Learning and Data Science. Developed and deployed high-performance ML models using ResNet architecture and custom pipelines. Demonstrated success in implementing scalable AI solutions. Seeking opportunities to leverage technical skills and advance expertise in AI/ML and data engineering.

PROJECTS

- **Face Mask Detection** Personal project January 2025
 - Implemented a deep learning solution using transfer learning on ResNet18 architecture, achieving 98.38% validation accuracy through effective handling of class imbalance and data augmentation techniques
 - Developed a complete computer vision pipeline incorporating image preprocessing, model optimization, and real-time inference, demonstrating practical application of deep learning concepts
- **Flower Species Image Classifier** Udacity Nanodegree (AWS Scholarship) December 2024
 - Conducted comparative analysis of CNN architectures, selecting EfficientNet-B0 for optimal performance-size trade-off
 - Engineered transfer learning solution achieving 90.23% accuracy across 102 species while maintaining 17.9MB model size
- **Dog Breed Image Classifier** Udacity Nanodegree (AWS Scholarship) October 2024
 - Implemented and compared performance of multiple CNN architectures (AlexNet, VGG, ResNet) for fine-grained classification, achieving 80% accuracy across 120 dog breeds
 - Developed custom data preprocessing pipeline reducing training time by 30% while maintaining accuracy
- **Reproducible end to end machine learning pipeline** Personal Project July, 2024
 - Built an ML pipeline with MLflow and Weights & Biases, integrating automated testing, monitoring, and robust error handling
 - Deployed batch and real-time inference endpoints using FastAPI, achieving 99.9% uptime in production simulation
- **Precalculus Learning Application | Senior Project | Penn State** April 2024
 - Developed a React Native mobile app integrated with Contentful and Firebase.
 - Designed and implemented a gamified reward and user tracking system to boost learning engagement.

TECHNICAL SKILLS

- **Machine Learning & AI**
 - **Frameworks:** PyTorch, Keras, scikit-learn
 - **Applications:** Computer Vision, Transfer Learning, CNN Architecture Design
- **Mathematics & Statistical Computing**
 - **Libraries:** NumPy, SciPy, Pandas, Matplotlib, Seaborn
 - **Areas:** Linear Algebra, Probability Theory, Optimization
- **Software Development**
 - **Languages:** Python, C/C++, Java, JavaScript, TypeScript, SQL
 - **Tools:** Git, Docker, AWS, Linux
 - **Web:** React, REST APIs, React Native, Node.js, HTML/CSS, Tailwindcss

CERTIFICATIONS

AI/ML: AI Programming with python (Udacity) • Deep Learning • Machine Learning • NLP • Generative AI • Math for ML(DeepLearning.AI) **Other:** • C Programming with Linux (Dartmouth) • Frontend (Scrimba)

EDUCATION

Penn State University, BS in Computer Science / Minor in mathematics | PA, USA GPA: **3.25 / 4.0** May 2024
Community College of Philadelphia, Associate in Computer Science | PA, USA GPA: **3.50 / 4.0** May 2021

Courses: Data Structures and Algorithms | Operating System | Design Analysis Algorithms | Software Engineering | Database Design | Discrete Mathematics | Linear Algebra | Matrices

LEADERSHIP

- Active member of ACM, UPE (since Oct 2022), NSLS (since Oct 2022), and PTK (since Feb 2020)