Thabhelo Duve

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Education

Talladega College Talladega, AL
Bachelor of Arts in Computer Science and Mathematics — GPA: 4.0/4.0 *Aug 2023 – May 2027*
Relevant Coursework: Algorithms & Data Structures, Networks, Operating Systems, Web Dev, OOP, Calculus I-III, Discrete Math
Awards & Recognition: 8x Hackathon titles incl. US Army xTech 2x Finalist, Experian #IYKYK, American Airlines BE Smart Hackathon & 2x AABE Alabama Power Hackathon, Top 10% in the National Cyber League

Experience

Software Development Engineer Intern May 2025 – Aug 2025
Amazon *- Mobile App Growth Team* *Austin, TX*
- Developed a generative AI tool using Amazon Bedrock, and Titan models for intelligent data pipeline automation, processing 500TB+ of data with 99.7% accuracy, reducing manual data processing by 78%
- Built a RAG (Retrieval-Augmented Generation) pipeline integrating vector databases (Amazon OpenSearch), semantic search algorithms, and multi-modal embedding models to streamline cross-organizational data access.
- Developed a microservices architecture using AWS Lambda, API Gateway, and DynamoDB for scalable data ingestion, event-driven processing with SQS/SNS that handles 2M+ daily transactions with sub-100ms latency & failover mechanisms.

Founding Engineer Jan 2025 – Present
DeepUbuntu Labs — *https://www.deepubuntu.com* *Remote*
- Developing DeepUbuntu AV, an autonomous vehicle perception stack with multi-modal sensor fusion (LiDAR, RADAR, RGB, IMU) optimized for edge cases such as unpaved roads, informal traffic flows, and underrepresented driving conditions.
- Engineered large-scale data labeling pipelines with offline-first annotation workflows, automated quality control (SNR scoring, clipping/silence detection), and dataset versioning for supervised learning at scale.
- Building synthetic data generation modules leveraging domain randomization, GAN-based scene augmentation, and physics-driven simulators to anticipate safety-critical anomalies before real-world incidents occur.
- Implementing end-to-end MLOps infrastructure with Kubernetes-based model serving, Apache Kafka for high-throughput sensor streaming, Redis caching for low-latency retrieval, and a Prometheus/Grafana observability stack for perception KPIs.

PROJECTS & INNOVATIONS

3D Medical Image Segmentation Benchmark | *Python, PyTorch, MONAI, nnU-Net, 3D U-Net, V-Net*
- Designed comparative study across 4 3D deep learning architectures (3D U-Net, V-Net, nnU-Net, SwinUNETR) on volumetric CT & MRI datasets for tumor segmentation.
- Implemented preprocessing pipelines (HU windowing, resampling, normalization, patch-based sampling) and GPU-optimized training with mixed precision and distributed data parallel.
- Benchmarked models using Dice coefficient, Hausdorff distance, and inference throughput, providing insights into accuracy-latency-memory tradeoffs for clinical deployment.

Singapore Traffic Density Classification | *Python, PyTorch, Keras, OpenCV* *github.com/Thabhelo/traffic-density-classification*
- Published spatio-temporal classification model integrating CNNs with LSTMs for vehicle density classification on traffic camera datasets in Singapore's CBD (Publication on ReadyTensor).
- Built dataset pipeline with OpenCV preprocessing, adaptive background subtraction, and YOLO-based vehicle detection to feed into CNN-LSTM classifiers.
- Optimized deployment with AWS GPU clusters, model quantization, and batch streaming for real-time inference <150 ms latency and classification accuracy above 92%.

FinePrint | *JavaScript, spaCy, LangChain, DeBERTa-v3, FastAPI* *https://www.fineprint.vercel.app*
- Engineered an NLP contract-intelligence platform leveraging transformer-based models (DeBERTa-v3) with spaCy tokenization and semantic search, securing $12K seed funding.
- Implemented hybrid classification pipeline combining fine-tuned embeddings, regex heuristics, and ensemble learning for multi-label risk detection with confidence calibration.

CowCow CLI | *Rust, FastAPI, SQLite, gRPC, Voice Activity Detection, SNR Analysis* *github.com/Thabhelo/cowcow*
- Open-sourced offline-first audio data collection tool with quality control (SNR analysis, clipping detection, VAD) and token-based reward system for distributed dataset generation.
- Developed advanced export pipelines supporting multi-format outputs (JSON/WAV), dataset integrity validation, and automated QC metric-driven curation.

Technical Skills

Certifications: CS50, AWS Cloud, Swift II, AI/ML & Culture, Machine Learning University @ AWS, Version Control
Technologies: Java, Python, SQL, JavaScript, HTML/CSS, Rust, Git, Docker, Kubernetes, AWS, Redis
Frameworks & Libraries: React, Node.js, Express.js, Django, Flask, FastAPI, Pandas, PyTorch, LangChain, NumPy, Prometheus/Grafana, spaCy, OpenCV
Professional Development: ColorStack, CodePath, BEYA, TMCF, Apple HBCU C², Propel, 300+ hrs Community Service
Languages: English (Professional), Zulu (Native), Shona (Professional), Spanish (Elementary)