

# JEAN RODRIGUE BITSINDA IKUZWE

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## SUMMARY

Perception and data-quality practitioner with experience supporting computer vision pipelines through dataset preparation, consistency checks, and evaluation. Detail-oriented, process-driven, and comfortable working with SOPs, edge cases, and fast feedback loops with engineers and researchers.

## EXPERIENCE

### Carnegie Mellon University Africa

Kigali, Rwanda

- **Research Associate – Systems & Data Engineering** Jul 2025 – Dec 2025
  - ★ Built reliable multi-node sensor data pipelines by collecting, synchronizing, and validating telemetry; identified packet loss, timestamp drift, and corrupted records.
  - ★ Improved dataset usability by cleaning, normalizing, and enforcing schema/unit/metadata consistency across heterogeneous sensor sources.
- **Graduate Research Assistant – AI/ML Engineer** Sep 2024 – Dec 2024
  - ★ Standardized data collection and dataset curation for a 3D reconstruction workflow, enabling repeatable experiments and clearer annotation/QA conventions.
  - ★ Supported peer-reviewed publications (IDETC-CIE ASME 2024 Best Paper; *ASME Journal of Mechanical Design*) via versioned datasets, experiment logs, and evaluation criteria.
  - ★ Reduced prototype design cycle time by **40%** by integrating automated workflow steps and documenting handoffs for team reuse.
- **Taxi Fare Prediction Application (Cloud Computing Capstone)** Oct 2024 – Dec 2024
  - ★ Implemented reproducible preprocessing and validation checks to convert noisy inputs into model-ready features; deployed a low-latency API (< 200 ms) on App Engine.
- **Smart Sorter: Real-Time Waste Classification on Edge (DL Capstone)** Feb 2024 – Apr 2024
  - ★ Achieved **94%** accuracy by curating a balanced dataset, generating synthetic images (Stable Diffusion), and applying consistent labeling rules.
  - ★ Performed k-fold cross-validation and error analysis to identify ambiguous samples and common failure modes; optimized deployment with TensorRT.
- **Unified Data Aggregation & Visualization Pipeline (DB Capstone)** Sep 2024 – Dec 2024
  - ★ Resolved schema mismatches across PostgreSQL/MongoDB; automated ETL (Prefect) and built Dash/Plotly monitoring for data quality and traceability.

### ICTP-East African Institute for Fundamental Research (ICTP-EAIFR)

Kigali, Rwanda

- **Graduate Researcher – Machine Learning** Jan 2023 – Jul 2023
  - ★ Improved molecular prediction accuracy by **30%** by fitting Potential Energy Surfaces (ANN, KNN, Gaussian Processes) and validating in quantum-dynamics simulations.

## EDUCATION

- **M.Sc. in Electrical & Computer Engineering (Applied Machine Learning)** Aug 2023 – Dec 2024  
Carnegie Mellon University Africa, Kigali, Rwanda  
**Coursework:** ML for Engineers, Deep Learning, Cloud Computing, Data Inference & Applied ML, Data Structures & Algorithms, Applied Computer Vision, Data Analytics, Advanced Database Systems, Applied Stochastic Processes, GIS.
- **M.Sc. in Condensed Matter Physics** Dec 2021 – Dec 2023  
ICTP–East African Institute for Fundamental Research, Kigali, Rwanda  
**Coursework:** Mathematical Methods in Physics, Numerical Methods I & II, Advanced Statistical Mechanics, Statistical Physics.
- **B.Sc. in Physics** Sep 2016 – Dec 2020  
University of Rwanda – College of Science & Technology, Kigali, Rwanda

## SKILLS (RELEVANT)

**Perception/Data:** dataset curation, labeling SOPs, QA checks, edge cases, error analysis, documentation

**Tools:** Python, SQL, Pandas/NumPy, OpenCV, PyTorch, Git/GitHub, PostgreSQL, MongoDB, Prefect

**Cloud/Deploy:** GCP (Vertex AI/App Engine), Docker, CI/CD basics