# Isaac Owomugisha

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## EXPERIENCE

- **Tunga**                                                                    Kampala, Uganda
  *Backend Software Engineer (Django)*                                          *Nov 2023 - Present*
    - **Engineered AI-powered Talent Matching System (Tunga-agent)**: Led the development of a multi-stage AI solution for developer matching, leveraging **Retrieval Augmented Generation (RAG)** to connect clients with the most suitable candidates. The system uses a Pinecone vector database for semantic search, an intent analysis module to understand complex queries, and a custom ranking algorithm. It integrates with the **OpenAI API** and supports local models via **Ollama**, ensuring flexibility and cost-effectiveness.
    **Core Technologies:** Python, Django, OpenAI, Pinecone, Ollama, PostgreSQL.
    - **Developed an AI-powered resume parser**: Implemented a feature that automatically populates developer profiles during onboarding by intelligently parsing resumes. This improved the efficiency of the profile creation workflow and reduced manual entry for developers.
    - **Enhanced invoicing system**: Implemented multi-line and multi-developer invoicing functionality, allowing clients to receive consolidated invoices with multiple line items. This streamlined billing processes, improved financial workflow efficiency, and enhanced client satisfaction.
    - **Optimized platform performance**: Diagnosed and resolved "N + 1 query" issues across several backend endpoints, leading to significant performance improvements in the API.
    - **Implemented developer and payment system enhancements**:
        * Developed profile export functionality, enabling developers to automatically generate professional CVs from their Tunga profiles.
        * Expanded payment options by enabling USD transactions (previously limited to EUR), reducing currency conversion fees for both Tunga and developers.

- **Sunbird AI**                                                               Kampala, Uganda
  *Software Engineer and Team Lead*                                            *May 2020 - Oct 2023*
    - **Leadership**: Provided technical leadership and mentorship to a team of developers and interns, ensuring the successful productization of ML models and effective management of MLOps workflows.
    - **Model Deployment**: Spearheaded the deployment of language translation models to an Amazon Sagemaker endpoint, facilitating seamless integration through an API for external users. Later on, led the migration from Sagemaker to GCP Vertex AI. These models power the Sunbird API.
    - **Language Translation API**: Developed and led the implementation of the Sunbird AI API, offering language technology services including translation, speech recognition, and text-to-speech in Ugandan local languages. Currently, the API is being utilised by Ugandan companies within their applications and was used in the IndabaX language technology hackathon.
    - **Language Translation Frontend**: Revamped the front end of the Ugandan languages translation app, transitioning it from vanilla Javascript to React, thus enabling faster feature development and eliminating a whole class of state-related bugs. This app played a pivotal role in the successful launch of Sunbird AI.
    - **Noise Monitoring**: Established the end-to-end infrastructure (including back end and front end) for the Environmental Noise Monitoring System in Kampala and Entebbe. Subsequently, orchestrated the migration of core components from a self-hosted setup to AWS IoT, significantly enhancing reliability and robustness. The Mayor of Entebbe relies on this system for monitoring and mitigating noise in the city.

- **Andela**                                                                   Kampala, Uganda
  *Software Engineer*                                                          *Aug. 2018 – Apr. 2020*
    - **Android development**: Built offline-functionality features for the Converge app (an internal meeting room management mobile app). Also improved how we wrote instrumented tests to mimic offline situations using the Test Butler library.
    - **Leadership**: Mentored new developers during their apprenticeship period by assigning them tasks, conducting code reviews and providing technical guidance.

- **Makerere University Data Science and Artficial Intelligence Lab**          Kampala, Uganda
  *Software Engineer Intern*                                                   *Jun. 2017 – Sept. 2017*
    - **Android development**: Developed a photo-annotation feature in the Android White-Fly count app which helped farmers to annotate pictures of white-fly infested cassava leaves.

## Education

- **Makerere University**                     Kampala, Uganda
  *Bachelor of Science in Computer Science*           *Aug. 2015 - Apr. 2018*

- **Coursera Courses**                         online
  *key specializations*
  - Machine Learning Specialization
  - Mathematics for Machine Learning
  - Deep Learning Specialization

## Projects

- **AcuGemma**: On-Device AI Tutoring App
  - **Developed an on-device AI tutoring application for primary school students**: Integrated the Gemma 3n 2B LLM directly onto an Android device using MediaPipe, which ensures user privacy, rapid response times, and full offline capability. The application features a dynamic prompting system that guides lessons, evaluates student responses, and provides context-aware feedback.

- **Uganda Coffee Traceability Dashboard**: Geospatial Data Visualization & Verification Tool
  - **Developed a dashboard to verify 97,000+ coffee plots against 2020 satellite baselines.**: Integrated 10m-resolution Google Earth Engine data into a GeoDjango and PostGIS backend, featuring a GraphQL API for real-time coordinate verification and a React-Leaflet interface that manages high-density spatial layers through district-level filtering and geometry optimization.

## Programming Skills

- **Languages**: Python, Javascript, Kotlin          **Technologies**: Django, React, FastAPI, AWS, GCP