Kilimanjaro Christian Medical Centre
An Institution of the Good Samaritan Foundation

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All correspondence should be Addressed to the Executive Director

VACANCY ANNOUNCEMENT

TITLE: Data scientist

DEPARTMENT: Ophthalmology Department

LOCATION: KCMC Hospital, Moshi

JOB TYPE: Full Time

DURATION: Employment Contract shall be for the tenure of 4 years and 6 months, subject to terms and conditions prescribed in the contract.

1. Introduction

Preventing Sight Loss from Diabetic Retinopathy Using Artificial Intelligence is a five-year program implemented under the KCMC Eye Department to screen the eyes of diabetic patients in the Kilimanjaro and Arusha Regions.

The aim of the project is to detect early features of diabetic retinopathy among diabetic patients and refer them to the KCMC Eye Department for timely treatment before irreversible eye damage occurs.

2. Structure of Authority

The Data Scientist will report to the Project Lead at KCMC Eye Department, and will work closely with the Eye Department management team, project partners, and stakeholders at community, district, regional, and national levels.

3. Main Responsibilities

The data scientist will:

- Develop, train, and fine-tune deep learning models for Diabetic Retinopathy screening using retinal fundus images, including CNN and Vision Transformer–based architectures.
- Work closely with ophthalmologists and clinical experts to ensure correct data selection, clinical relevance, and accurate labeling of retinal fundus images.
- Design and implement robust image preprocessing, augmentation, and quality control pipelines tailored to ophthalmic imaging data.
- Curate, manage, and validate large-scale retinal imaging datasets, incorporating clinical feedback to improve annotation accuracy and consistency.
- Apply transfer learning and model optimization techniques to enhance screening performance and computational efficiency.
- Evaluate model performance using clinically relevant metrics and conduct detailed error analysis in collaboration with clinicians.
- Identify and mitigate data bias, class imbalance, and generalization risks across populations, devices, and acquisition settings.
- Implement explainable AI (XAI) methods (e.g. Grad-CAM, saliency maps, attention visualization) to support interpretability and clinician trust.
- Optimize model training on GPU-enabled Linux systems, ensuring reproducibility, version control, and efficient experimentation.

- Support deployment and integration of the AI screening tool into prototype web, mobile, or API-based systems, including clinical pilot support

4. **Specific Roles**

- Develop, train, and optimize deep learning models for **Diabetic Retinopathy screening**, including **CNNs and Vision Transformer (ViT)-based architectures**, using retinal fundus images.
- Design and implement robust **image preprocessing, augmentation, and data curation pipelines** for high-quality retinal imaging data.
- Manage and annotate large-scale retinal imaging datasets in collaboration with clinical experts, ensuring annotation quality and consistency.
- Evaluate model performance using **clinically relevant metrics** and address bias, class imbalance, and model generalizability.
- Apply **explainable AI (XAI) techniques** (e.g. saliency maps, Grad-CAM, attention visualization) to support model interpretability and clinical trust.
- Optimize model training on **GPU-enabled Linux systems** and support deployment and integration of the AI screening tool into prototype web, mobile, or API-based applications.

5. **Qualification and Skills**

Essential:

- Master's degree in data science, Artificial Intelligence, Machine Learning, Computer Science, Biomedical Engineering, or a related quantitative field.
- Strong proficiency in Python for machine learning and scientific computing
- Hands-on experience in computer vision, with emphasis on medical image analysis (retinal fundus images preferred)

- Experience using deep learning frameworks such as PyTorch and/or TensorFlow/Keras
- Practical experience with CNN-based architectures (e.g. ResNet, EfficientNet, DenseNet, Vision Transformers) for image classification and/or segmentation
- Experience with image preprocessing pipelines, including normalization, augmentation, resizing, and artifact handling
- Proven experience with transfer learning and fine-tuning pretrained models on domain-specific datasets
- Experience managing large-scale image datasets, including annotation workflows, quality control, and metadata documentation
- Experience training models on GPU-enabled systems and working in Linux-based environments, with version control using Git/GitHub
- Experience deploying AI models into practical systems (REST APIs, web or mobile applications) and communicating results in clinically meaningful terms

Desirable:

- Prior exposure to retinal fundus images, Diabetic Retinopathy grading, or ophthalmology-related datasets (e.g. ICDR/ETDRS standards).
- Familiarity with deploying trained models into web, mobile, or API-based applications, including basic knowledge of model optimization for real-world use.
- Experience contributing to peer-reviewed publications, technical reports, or grant-funded research projects, particularly in healthcare or medical AI.

6. Mode of Application

- Applications should be addressed to The Executive Director accompanied with certified of relevant certificates, Curriculum vitae, names and Telephone numbers of referees. The application can be dropped physical at KCMC Eye Department or via mail kcmcadmin@kcmc.ac.tz cc kcmceyedep@gmail.com

- Closing date for receiving application is 15th January 2026.