

CMU Challenge Guidelines

2024 Rwanda Space Week.

Students Outreach Program

TRL SPACE ⬆



1. Challenge Overview

University students are tasked with developing an AI model that can accurately detect and differentiate between vegetation, water bodies, and urban houses from a set of five images provided by the challenge facilitators on the day of the event. Students can use any data set of their choice for training but will not receive the challenge images until the event starts. The team with the most accurate model will win the competition.

Challenge Day Instructions:

1. Technical Requirements:

- Each team must consist of 4 students.
- Teams must bring their own laptops pre-installed with the necessary AI development environments, libraries, and tools (e.g., Python, TensorFlow, Keras, PyTorch, etc.).

2. Pre-Challenge Preparation:

- Teams are encouraged to research and experiment with image classification and object detection techniques before the challenge.
- Participants may train their AI models on publicly available datasets that include images of vegetation, water bodies, and urban houses to prepare.
- They are free to use pre-trained models and transfer learning techniques if desired.

3. Data Set Requirements:

- Teams are allowed to use any publicly available dataset for training their models before the challenge (e.g., satellite imagery datasets, aerial photography datasets, etc.).
- The dataset should include images of vegetation, water, and urban houses to ensure relevance to the challenge.

4. Challenge Day:

- Upon arrival, each team will receive **five images** from the challenge facilitators. These images will contain a mix of vegetation, water bodies, and urban houses.
- Teams will be given **1 hour** to fine-tune their models using the five provided images for inference. No additional data or internet access will be allowed during this time.

5. Model Development:

- Teams should use their pre-trained models to predict whether the images contain vegetation, water, or urban houses.
- The models must output the class (vegetation, water, urban house) for each image with a corresponding confidence score.

6. Submission Guidelines:

- Teams must submit:
 - The predicted classifications for each image.
 - The confidence scores for each prediction.

7. Evaluation Criteria:

- **Accuracy:** Teams will be evaluated on how accurately their model identifies the contents of the five images.
- **Confidence Scores:** Models should provide confidence scores for each prediction, which will factor into the evaluation.
- **Innovation:** Bonus points will be awarded for innovative model architecture or use of AI techniques.

8. Tools & Resources:

- Suggested tools include Python, TensorFlow, PyTorch, Keras, OpenCV, scikit-learn, and other machine learning frameworks.
- Teams should also bring external storage or any other equipment they may need to work efficiently during the challenge.

Contact Information:

For any questions regarding the challenge or the submission process, please contact **0794420377**.