Assignment: AI Future Directions

Task 1 – Image Classification Using Edge AI

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Objective

The proposed project focuses on the development of a lightweight model of image classification that would classify between recyclable and non-recyclable waste. The training is done with the TensorFlow model, which is transferred to the edge device as a TensorFlow Lite model.

Dataset

- ✓ Source: The images were retrieved from the internet with the help of the ddgs Python library.
- ✓ Classes: Recyclable, non_recyclable
- ✓ The images per class: 20
- ✓ Size of the image: 128x128 pixels

Model Summary

- Framework: TensorFlow Keras
- Architecture: 2 conv ls, max pooling, dense ls
- The shape of the input: 64x64x3
- Loss function: Binary cross-entropy
- Optimizer: Adam
- Epochs: 10

Results

- Metric Value
- Training Accuracy   X.XX%
- Positive predictive value   Y.YY%
- Inference Time   ~Low (Edge Test)
- Model Size (.tflite)   1-2 MB
- Put your own training log actual results in place of the X.XX and Y.YY values.

Deployment Steps

1. Train a model with TensorFlow/Keras.
2. Store the model in.h5.
3. Use the TensorFlow Lite converter to convert it to. tflite.
4. Test in the tf.lite.Interpreter on Sample Image.

Edge AI advantages

i.   Shortened latency: Instant decisions are made on the device.

ii. Better privacy: No cloud exchange of pictures.

iii. Offline Able: Does not need the internet.

iv. Resource-efficient: It is powered by a Raspberry Pi or a phone.

Export and Save

Save as. docx (Word format)

OR in the menu select File, select Export, and choose PDF