Onboard AI with TensorFlow Lite on the SmartCam App

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Background

- Problem and Solution:
  - Lots of “bad” images downlinked during camera commissioning.
  - Not great for data downlink prioritization.
  - Trained image classification model to run as an on-board SmartCam app.
  - Only downlinking images of value.
  - Discard “bad” images immediately after image acquisition.

- App was designed with re-usability in mind:
  - Can run image classification models provided by other experimenters.
  - Can create model pipelines and branching rules.
  - Uses industry established AI framework attract non-space sector experts.
Janet’s picture type detection model

edge  bad  earth
Janet’s picture type detection model

Brad’s cloud detection model

earth

edge

bad

not cloudy

cloudy

Janet’s picture type detection model

Brad’s cloud detection model

Moving Forward

- Crowdsource image classification models and start building an ML chain.

- Deploy other AI Inference API Frameworks on SEPP and FPGA:
  - The SmartCam app uses TensorFlow Lite C API on SEPP.
  - But other popular frameworks include PyTorch and CAFFE.
That’s all folks, thank you!

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