I have developed a Convolutional Neural Network (CNN) model using TensorFlow-GPU, CUDA, OpenCV, and NumPy to classify images into specific aircraft classes.
The dataset consists of images related to 14 aircraft classes, including various Airbus and Boeing models and the EF2000.

Goal:
During the video classification process, if the object in the video is predicted to belong to one of the specified aircraft classes,
the video frame is boxed in green. The predicted object class is mentioned in the right-most corner of the frame.
If the object in the video does not belong to any of the specified classes, the video frame is boxed in red.
The object is mentioned in the right-most corner as well.

Libraries Used: TensorFlow-GPU, CUDA, OpenCV , NumPy

Dataset Information:

Training Set: 4574 images
Test Set: 2138 images
Classes: ['Airbus-A220', 'Airbus-A300', 'Airbus-A310', 'Airbus-A320', 'Airbus-A330', 'Airbus-A350', 'Airbus-A380', 'Boeing-B707', 'Boeing-B727', 'Boeing-B737', 'Boeing-B767', 'Boeing-B777', 'Boeing-B787', 'EF2000']

Model Architecture:
The CNN model is defined as follows:

Convolutional Neural Network (CNN) with three convolutional layers, max-pooling layers for downsampling,
and densely connected layers. The final layer uses softmax activation for multi-class classification,
and the entire model is structured within a Sequential container.

Model Performance:

Accuracy: 0.0482 (4.82%)

The model has been trained on the provided dataset, and its current accuracy is relatively low, suggesting potential areas for improvement.

Conclusion:

Overall, further optimization, data augmentation, and fine-tuning may be
required to improve the model's accuracy and generalization to real-world scenarios.