Detecting dangerous items in X-Ray luggage scans

Enhancing travel security is crucial

Security when travelling has always been a major concern for both commercial and private aviation. X-Ray scans have played an important role in securing passenger safety, and the use of machine learning in this field is growing rapidly

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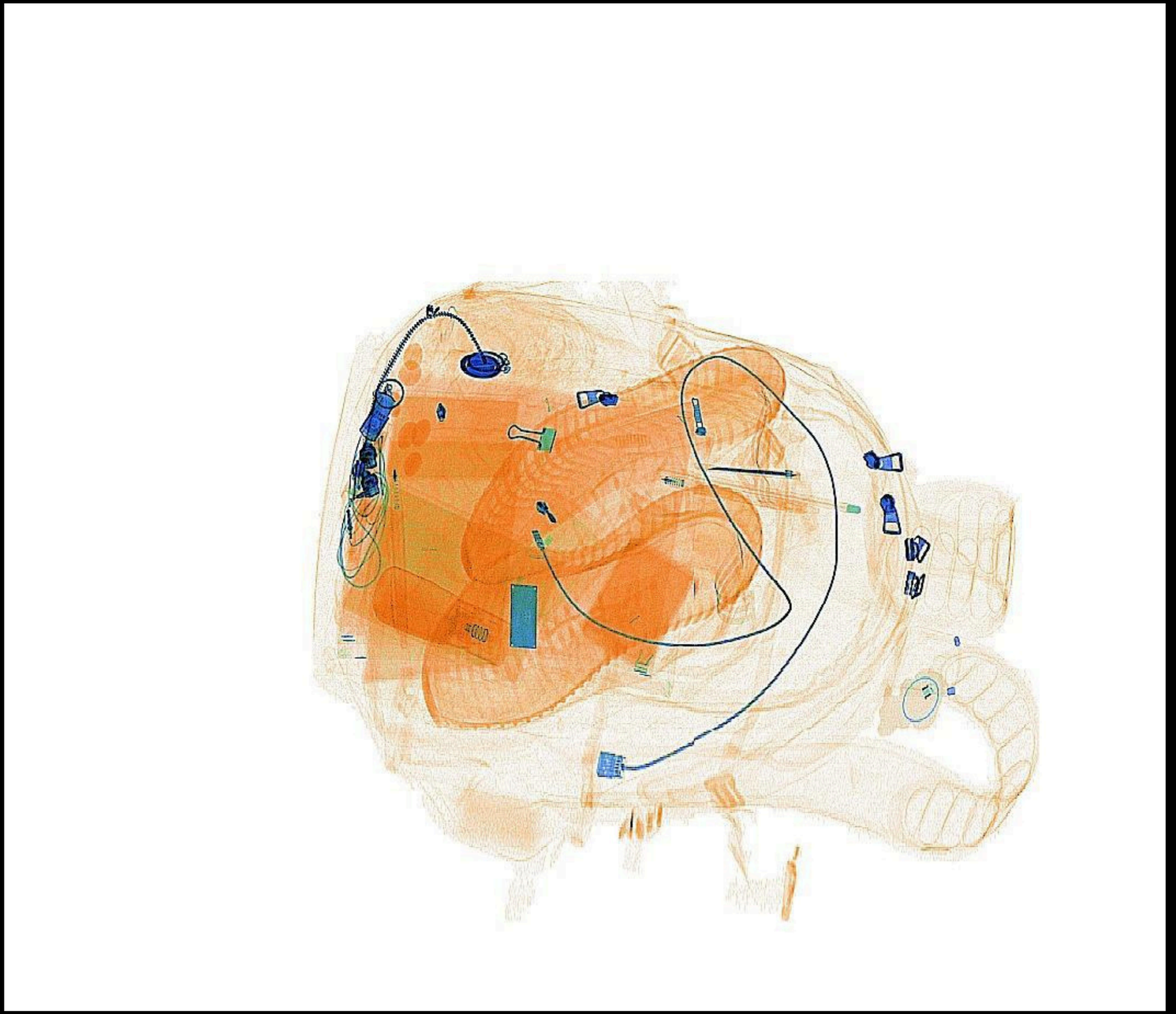
Can you spot the knife?



Dangerous items

The model is trained to recognize the presence of eight different classes of dangerous (or potentially dangerous) objects:

- Cameras
- Cellphones
- General electronic devices
- Knives
- Laptops
- Lighters
- Powerbanks
- Scissors

Augmentation

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gaussianblur -> edgedetection -> conv1 -> batchnorm -> tanh -> maxpool2d -> conv2 -> batchnorm -> tanh -> maxpool2d -> linear -> tanh -> linear

Pipeline

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Developed entirely with PyTorch

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SGD is used over Cross Entropy Loss in coonjunction with L2 regularization

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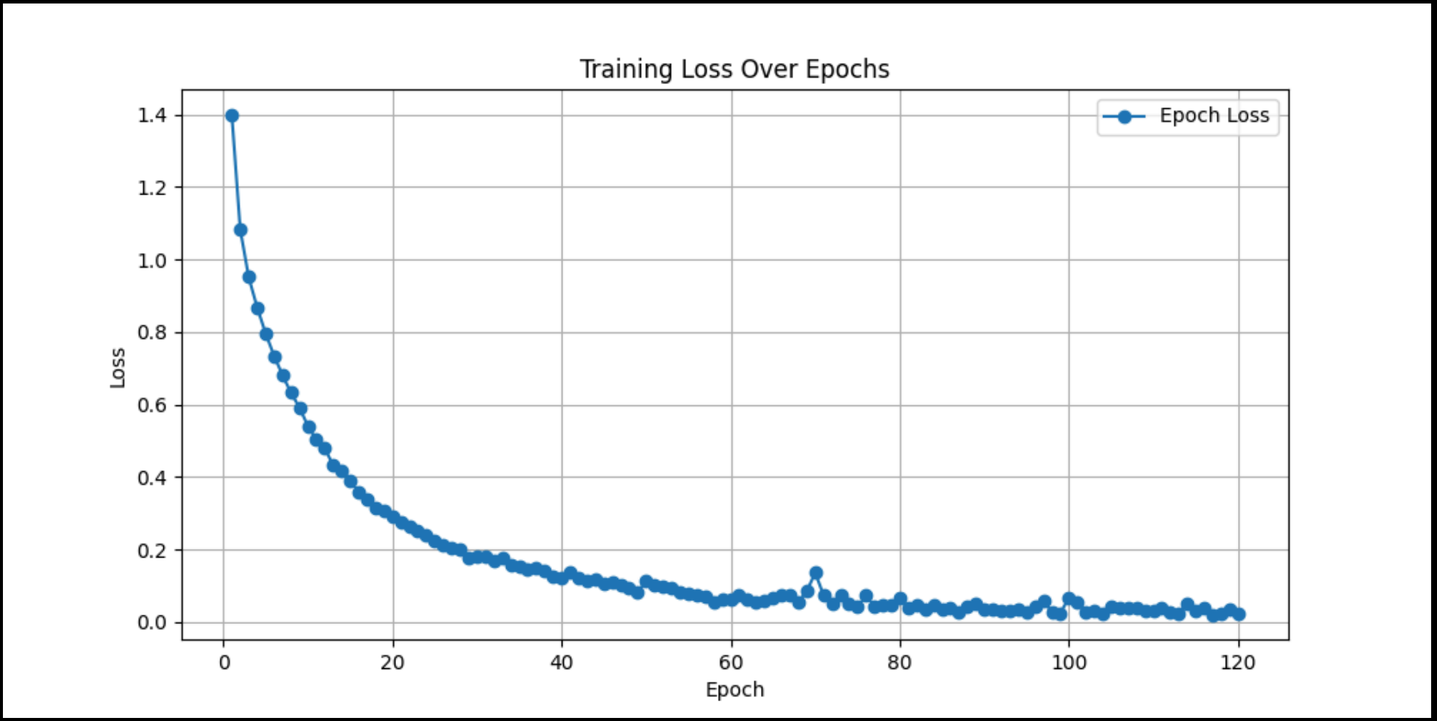

Project code at

https://github.com/ricvigi/ailab_project_private