ARTIFICIAL INTUITION

Detecting Enemy Infiltration at Army Bases

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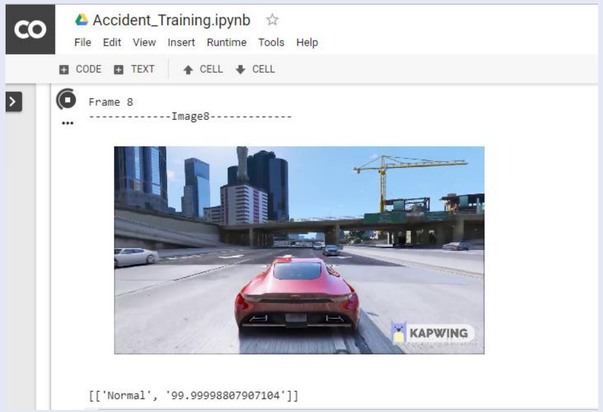
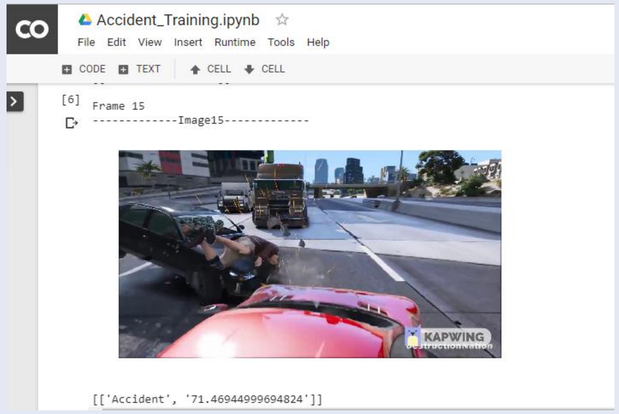
ABSTRACT

- Automating human controlled systems is needed
- With the current advancements in ML and AI technologies, enable machines to learn the ability of predicting anomalies and hence create **'Artificial Intuition'**
- Apply this intuitive technology to a defence use-case of detecting enemy infiltration at army bases



Normal Scene Video Frame

The algorithm extracts this image frame from an input video stream and classifies the image as a 'Normal' scene



Accident Scene Video Frame

The algorithm extracts this image frame from an input video stream and classifies the image as an 'Accident' scene

METHODOLOGY

Collection of video dataset of normal and accident videos

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Chopping videos into frames at 1 fps using image extraction

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Train the Deep Neural Network using ImageAI library to classify images

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Parse live streaming video input and classify it as normal or accident

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Evaluation of model performance on various inputs

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Plot confidence level of accident detection at temporarily spaced intervals

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Expand the approach to detect firing ,assault, explosions and enemy infiltrations

APPLICATIONS

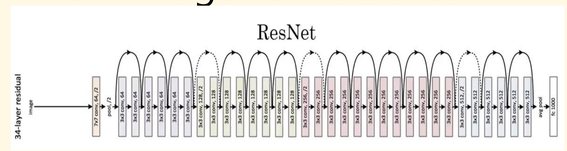
- Predict possibility of accident on roads
- Detect explosions in public places
- Predict burglary/assault and other anomalies
- Detect enemy infiltration at military bases

RESULTS

- Highest Validation Accuracy: 80.2548%
- Plot of the confidence of accident detection against time has an increasing trend.
- ~'T minus 3' seconds prior to the accident actually occurring, the algorithm predicts the possibility of an accident.

TECHNICALITIES

- **Dataset:** Frames from seconds before, during and after the occurrence of an accident as well as without accident from a video game that provides simulations close to real world.
- **Frame Extraction:** The video was processed as Images captured at 1 fps
- **Model:** ImageAI function *ResNet* was used for classifying images
  Resnet is a pre-trained convolutional neural network trained on over million images from ImageNet database.



- Model can **predict an accident** 3-4 seconds before the actual occurrence of an accident based on confidence values.

TECH STACK

ANACONDA · colab · TensorFlow · jupyter · Keras · python · ImageAI