Smile detection using Viola-Jones

Visual Computing Project

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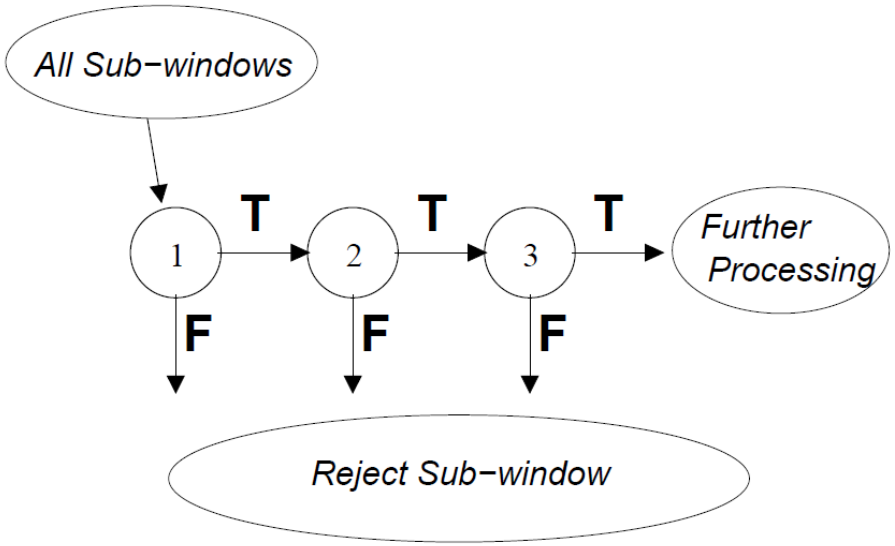
Agenda

- Task description
- Background
- Approaches
  - Live smile detection
  - OpenCV Haar Classification
  - TensorFlow / Keras
- Results
- Conclusion

Viola-Jones algorithm

- Developed in the early 2000s
  - OpenCV library
- Feature detection
- Detection cascade
  - Series of classifiers, applied to every sub-window
  - Increases effectiveness
- Different cascade-classifiers allow different feature detection

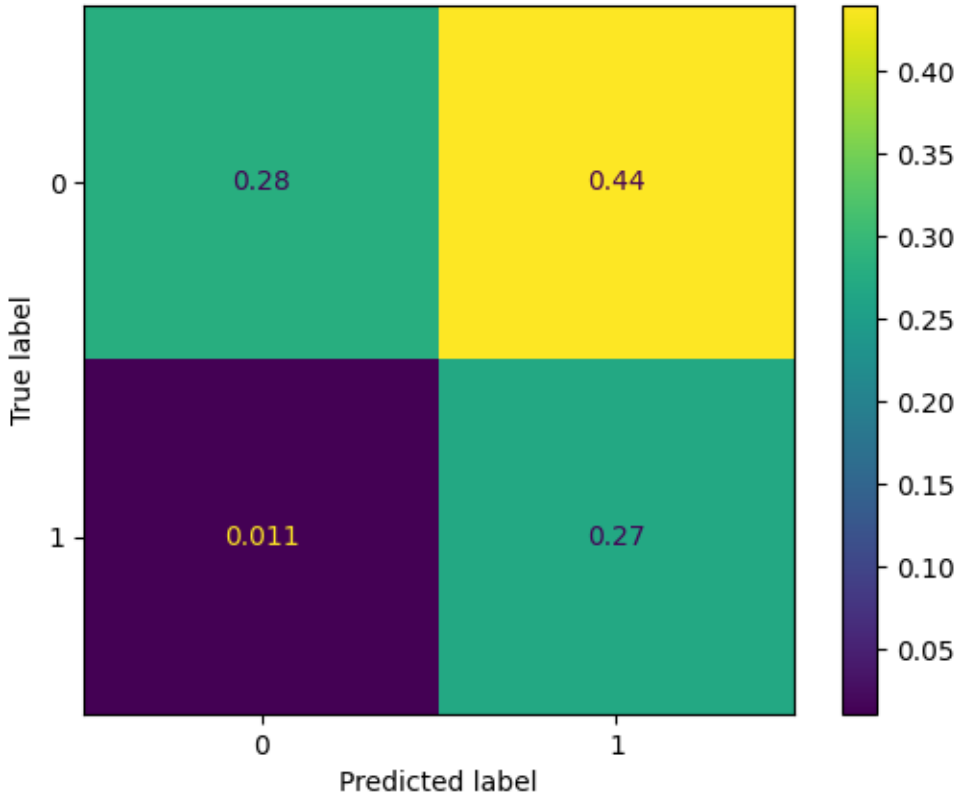


Approaches

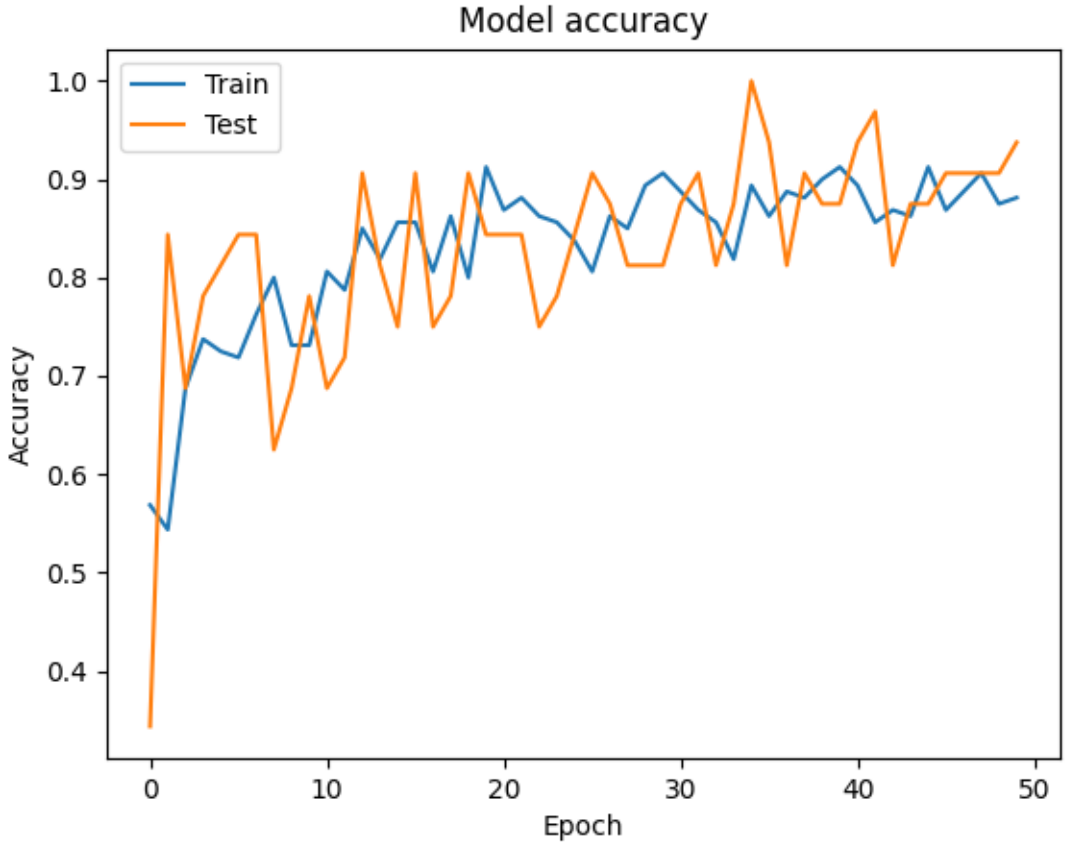
- Live smile detection
  - Using webcam
- OpenCV Haar Classification
- TensorFlow / Keras
  - Using a neural network

KEEP CALM ITS DEMO TIME

Results



Normalized Confusion Matrix using OpenCV Haar Classifier



keras.metrics accuracy-output

Conclusion

- Many approaches online
- Haar Classification is limited to the OpenCV classifiers
  - Decided to use TensorFlow
- Dirty dataset
- Serial implementation

Example of a False Positive sample in the dataset