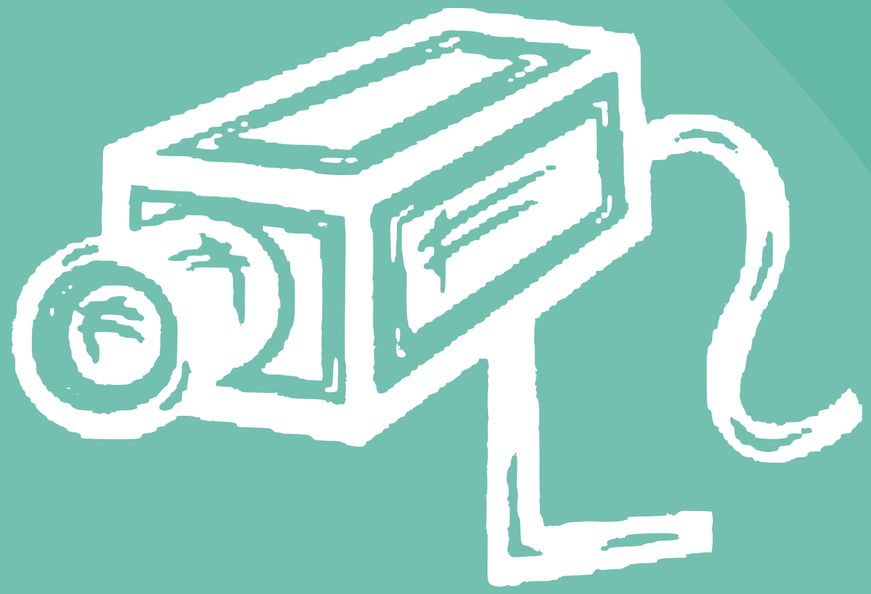
Violence Detection in Smart Cities



By:
Shahad Alowais
Shatha Almoteb

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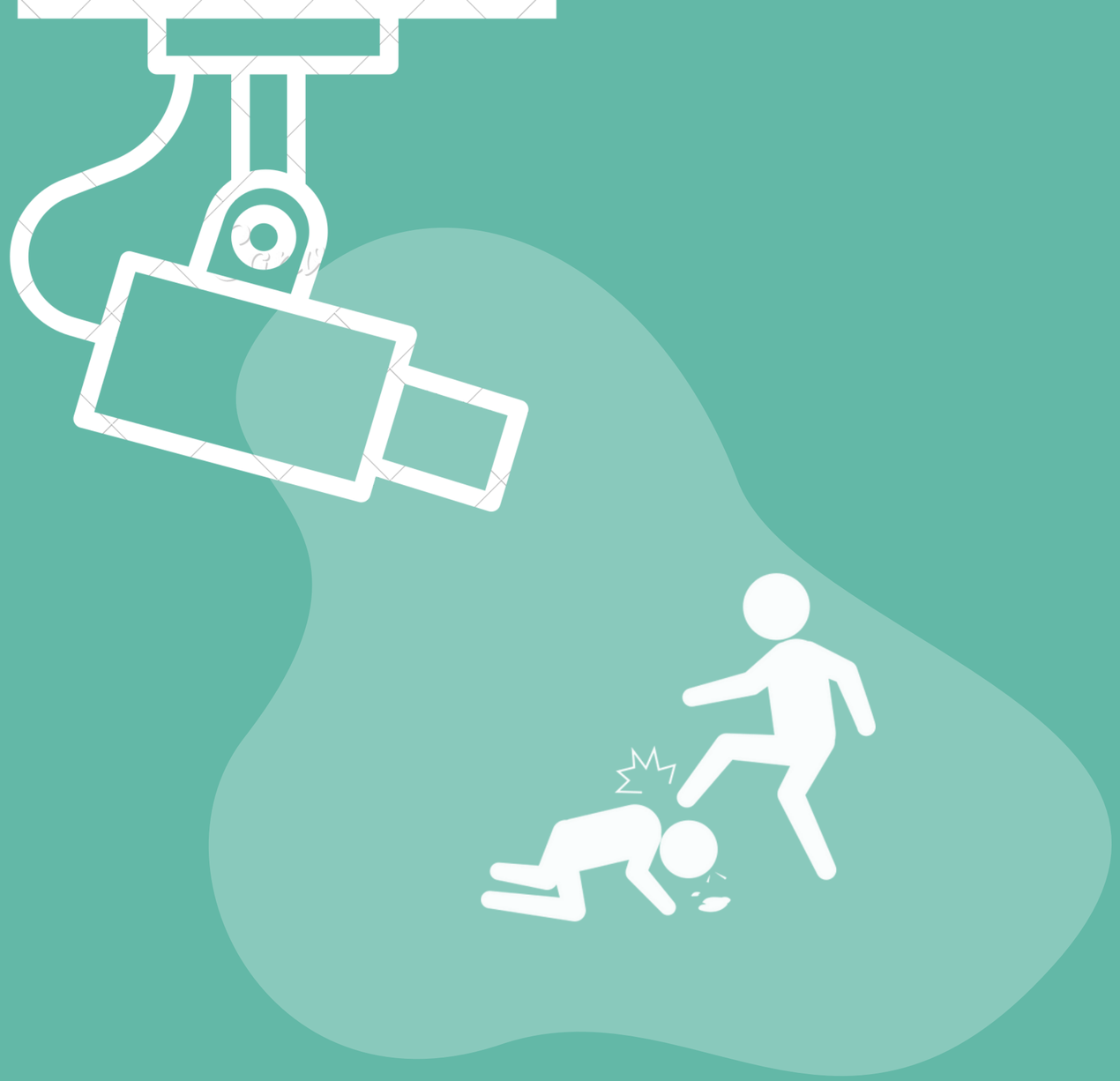
Problem Statement

With the increasing of surveillance cameras in modern cities, huge amount of videos can be collected.

While there are insufficient human resource for monitoring all the screens at one time.
We are considering how to use techniques of video understanding to detect violent behavior so that it can give a quick alarm in time.

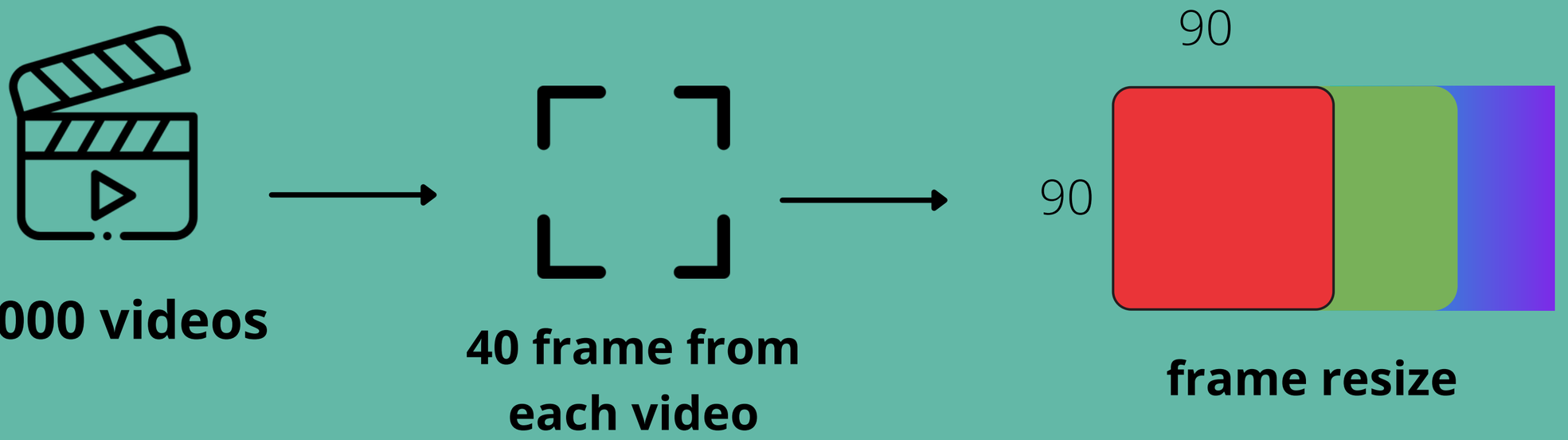


Data Story

Data Source

Dataset is from kaggle and it contains 1000 Violence and 1000 non-violence videos .

Data Preprocessing



The Input is (2000X40X90X90X3)

Modeling

Baseline

Simple neural network

Accuracy Scores
Validation: 0.53
Training: 0.50

Modeling

Experiment 1

- ConvLSTM2D
- Flatten
- Dropout(0.2)
- Dense 254 and 2

Experiment 2

- ConvLSTM2D
- Flatten
- Dropout(0.8)
-Dense 254 and 128

Experiment 3

- ConvLSTM2D
- Flatten
- Dropout(0.9)
- Dense 265 and 2

Experiment 4

- Conv1D
- Flatten
- Dropout(0.2 & 0.3)
- Dense 32 and 2

Modeling

Experiment5

-ConvLSTM2D
- Flatten
- Dropout(0.8)
-Dense 254 and 2

Experiment 6

- ConvLSTM2D
- Flatten
- Dropout(0.2 AND 0.3)
- Dense 254 and 2

Modeling

	Traning	Validation
Experiment 1	0.99	0.83
Experiment 2	0.94	0.73
Experiment 3	0.64	0.70
Experiment 4	0.87	0.70

Modeling

	Traning	Validation
Experiment 5	0.98	0.86
Experiment 6	1.00	0.86

Transfer Learning

	Traning	Validation
VGG16	0.94	0.88

Best Model

VGG16 Model

Traning	Validation	Test
0.94	0.88	0.88

Demo..

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Predicted: Violence
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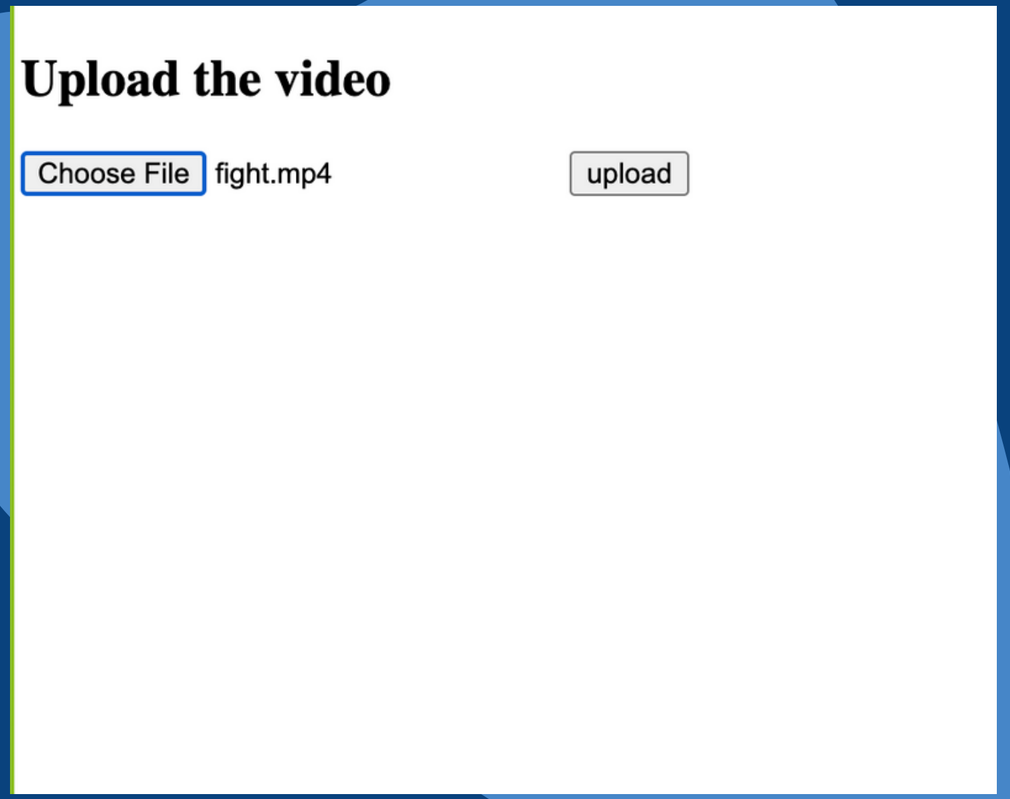
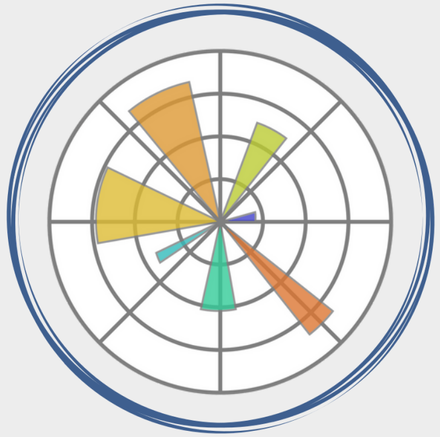


Tools



Challenges

1. Handling video-type data
2. The long time of running the model

Future Work

1. Implement geolocation for improved violence event reporting

Another important feature that may be considered in the future will be to add geolocation to every surveillance camera installation for informational purposes.

2. Train the model to better accuracy by searching for the best hyperparameters and optimizer

3. Implement multi-camera feed system

4. Build complete web app for visualization

Thank you..

Any Questions