DETECTION OF SEXUAL HARASSMENT

OneAPI powered by Intel

AGENDA

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ABSTRACT

Detecting sexual harassment helps societies understand the magnitude of the problem. Detecting sexual harassment in workplaces is crucial for the implementation of effective policies and protocols.

In response to the serious issue of sexual harassment in the workplace, we have developed an enhanced approach to detect instances of such harassment. Our approach utilizes a Convolutional Neural Network (CNN) for detection, Since our dataset uses videos, we use a Deep Learning model to make better detection.

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PROBLEM STATEMENT

DETECTING SEXUAL HARASSMENTS

Sexual harassment has become a serious issue, nowadays. Harassment in a workspace makes the entire environment offensive.

Creating a safe and respectful work environment is crucial for the well-being, productivity, and morale of employees.

Though detection does not put an end to the problem, it might work as surveillance and would result in lowering the chances of harassment.

Our solution is to attempt to build an environment safe and trustworthy by detecting any occurrences of unwelcome sexual appeals.

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SOLUTION

Our model will use a CNN(Convolutional Neural Network) for detection since the dataset uses videos using a Deep Learning model to make better detection.

A dataset containing videos will be used, out of which half will have harassment videos, and the other half will show a normal work environment.
We will follow 80:20 videos will be used for training our model and the remaining will be used for testing the model.

To further enhance the accuracy of the detection system, we are planning to implement Transfer Learning techniques by leveraging pre-trained models such as VGG16, Xception, and others.
These models have been trained on large-scale datasets and come with high accuracy levels.

TECH STACK

- OneApi
- OneDNN
- Intel(R) Extension for Scikit-learn
- Open CV
- Convolution neural network (CNN)
- Tensorflow
- Pandas
- Keras
- Jupyter Notebook

ONEAPI

OneAPI is a cross-architectural programming(hardware architectures) model in which, with the same code, we can run on CPU, GPU, AI accelerators or FPGA (Field-programmable gate array) by changing only one line of code.

USAGE OF ONEAPI

- oneDNN, a part of OneAPI, an open-source library developed by Intel, will be used in this project to optimize the performance and efficiency of the CNN model.
- Intel(R) Extension for Scikit-learn will be used, which provides a seamless way to speed up the Scikit-learn application.
- The TensorFlow framework, which is integrated with OneDNN, is used to achieve :
    - lower memory consumption.
    - higher accuracy.
    - faster training times.
    - better utilization of hardware resource.

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WORKING

DATA PREPROCESSING

As we are dealing with a video dataset, we will have to preprocess the videos before applying the model to them.
We will extract frames from videos and treat the dataset as an image dataset.
We will change the resolution while loading them into the model.

TESTED

We will introduce a CNN-based model and will test the dataset. We prefer CNN over other neural networks because CNN has a unique architecture that works better with images.
Like any other CNN-based model, we will have a stack of different layers in our model followed by some fully connected layers.

TRAIN, EVALUATION AND PREDICTION

We will train the model iteratively for a fixed number of epochs.
Once we are done with training, we will evaluate the model using a test dataset to compute it's accuracy.
Finally we will make use of the trained model to make predictions on any new data provided.
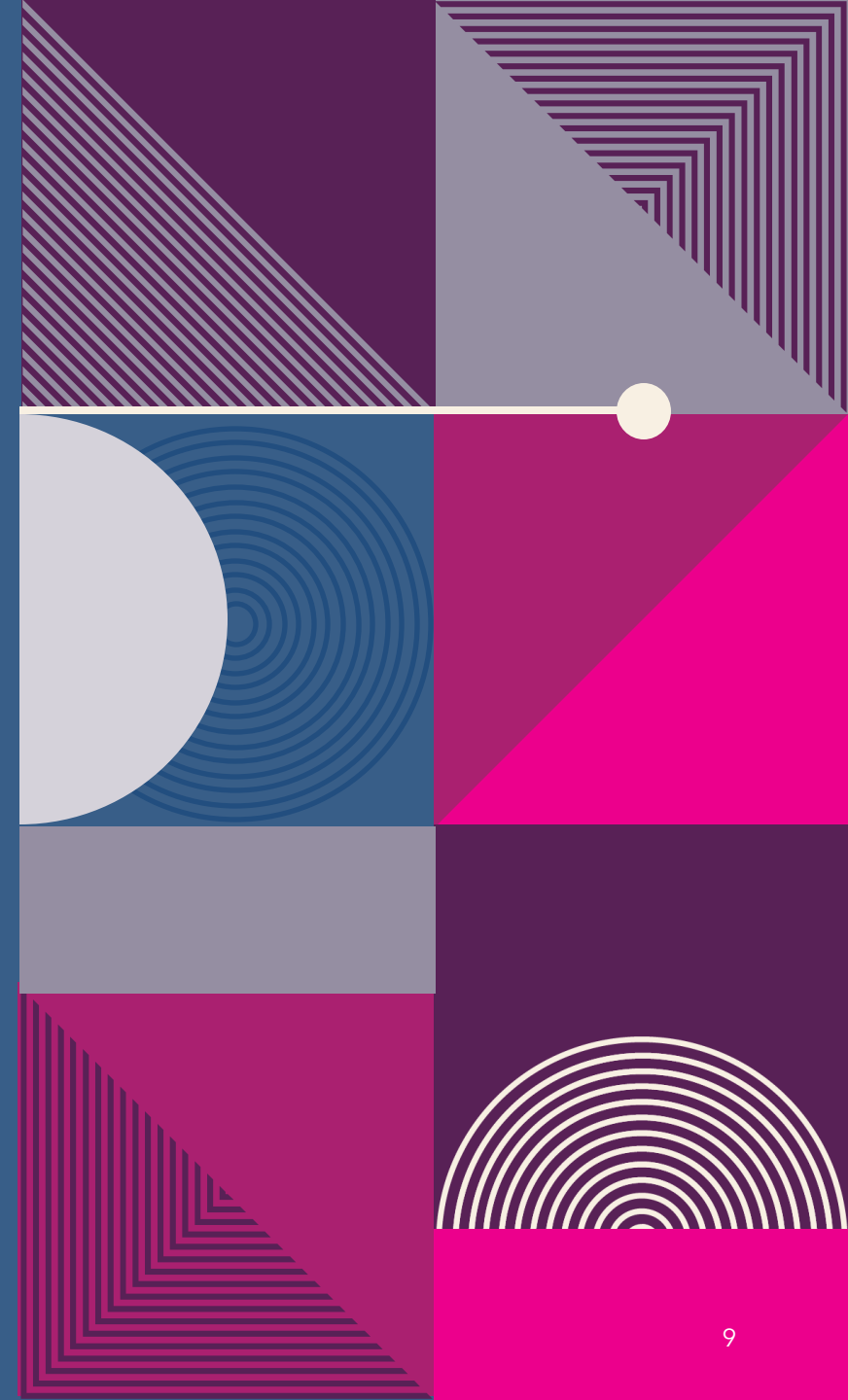
PRIMARY GOALS

Prevents future incidents

Detecting and taking action against these incidents helps in introducing policies that play a vital role in preventing the occurrence of such incidents.

Justice for the victim

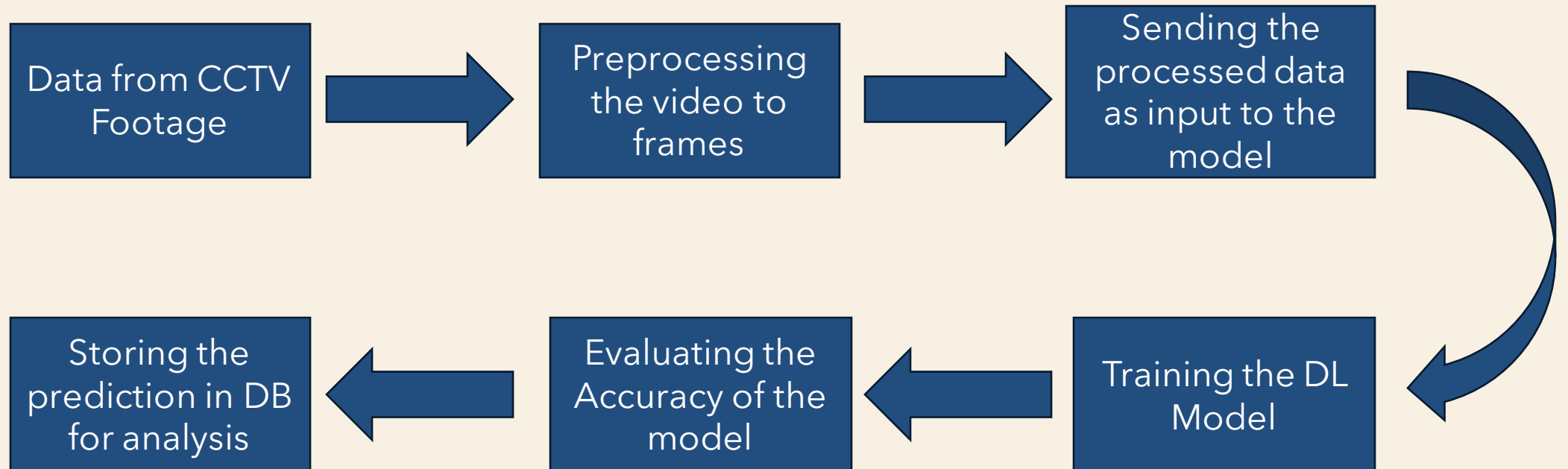This acts as a solid evidence to prove the instance of harassment and further helps in providing justice for the victim.

Creates Awareness

By detecting and addressing incidents of sexual harassment, awareness is created through media coverage, online platforms.

MODEL ARCHITECTURE

Data from CCTV Footage → Preprocessing the video to frames → Sending the processed data as input to the model

Storing the prediction in DB for analysis ← Evaluating the Accuracy of the model ← Training the DL Model

SCALABILTY

- **Deployment Infrastructure :**
    - Our solution is easy to implement in large scale as it focuses on using existing hardware resources present in the target premises.
    - As we plan on implementing our solution using OneApi, running any large model is not a problem as it's carried on in the cloud with powerful hardware.
- **Network Effect :**
    - The model will also benefit from the large dataset which is obtained when it is established in large scale, increasing the validity and accuracy of the model.
- **Versatile :**
    - This solution can be deployed in any places with social interactions.

BUSINESS MODEL

COLLABORATION AND INTEGRATION

Collaborating with relevant stakeholders, such as NGOs, governmental organizations, or social platforms.
Integrating existing systems, such as reporting platforms, social media APIs, or communication channels, can help scale the project's impact by reaching a wider audience and leveraging existing infrastructure.

SUBSCRIPTION BASED SERVICE

By using a subscription based model we can generate a steady source of income.

PRODUCTIVITY AND PEACE OF MIND

This can bring a peace of mind to all the people in that environment which can greatly help in maintaining good mental health which will greatly boost the productivity of the workspace.

PIPELINE

PHASE 1:
Making partnerships with government and NGO's for grants and generating awareness

PHASE 2:
Integrating a simple subscription model with nominal cost for sustaining the project and improve tech deployed

PHASE 3:
Bringing improvement to the product by adding additional detection models to the software as the existing hardware is flexible

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THANK YOU