An Artificial Deep Intelligence Fake Video Detection Platform

01

Introduction

- Deepfake.
- Deepfake Problems.
- Solutions Overview.
- FVD System.

02

Fake Video Detection Models

- Fake Video Creation
- FVD By CNN.
- FVD By Objects Movements.
- FVD By Eye Blinking.

03

Sentiment Analysis Using NLP

- Sentiment Analysis
- SMA Model.
- SMA Model with YouTube.

04

Software Development

- Use Case Diagram.
- Sequence Diagram.
- Activity Diagram.

05

User Interface (UI)

- LogIn and Registration
- Selection Source.
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- Results.

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- Introduction of Deepfake
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Sayed Abd-Elaleem Sayed.

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Agenda

1.Introduction.

2.Fake Video Detection Using Deep Learning.

3.Fake Video Detection Using Objects Movement.

4.Fake Video Detection Based on The Eye Blinking.

5.Sentiment Analysis of the video comments.

6.Software Development .

7.Implementation.

8.Summary.

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Introduction

What is the Deepfake Video?

- Deepfake is a technique that refers to editing videos to replace someone's face in a video with another someone's face in another video, and this can create a video of someone who says or does things he did not do.

- Generate fake videos is using Artificial Intelligence algorithms and models such as generative adversarial networks (GANs).

con...Introduction

Deepfake Problems

- The stir public opinion.
- It can be even used to generate unreal satellite images of the Earth to contain areas .
- Offending famous personalities
- Covid-19 (Corona Virus).

con...Introduction

Soluation Overview

we provide a new method to detect fake videos:-

- Based on Deep Learning Convolutional Neural Network (CNN).
- propose a model to detect the fake videos of the object-based type which are created by deleting or adding an item in the video.
- Detecting the eye blanking errors using (RNN).
- Sentiment analysis the data of video.

con...Introduction

Fake Video Detection System

Fake videos are recognized on some consecutive steps:

1. Collecting video data through the API as (**YouTube data V3 API**).
2. Data preparation where we separate the video from the comments then, convert video into frames and save the comments in CSV file.
3. Sentiment Analysis through preprocessing of the comments and Sentiment Analysis (SA) model.
4. Test the frames of the videos through preprocessing of the frames, fake and real videos classification model.
5. From all the previous steps, we determine if the video is fake or real

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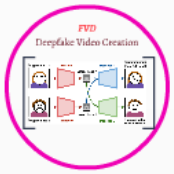

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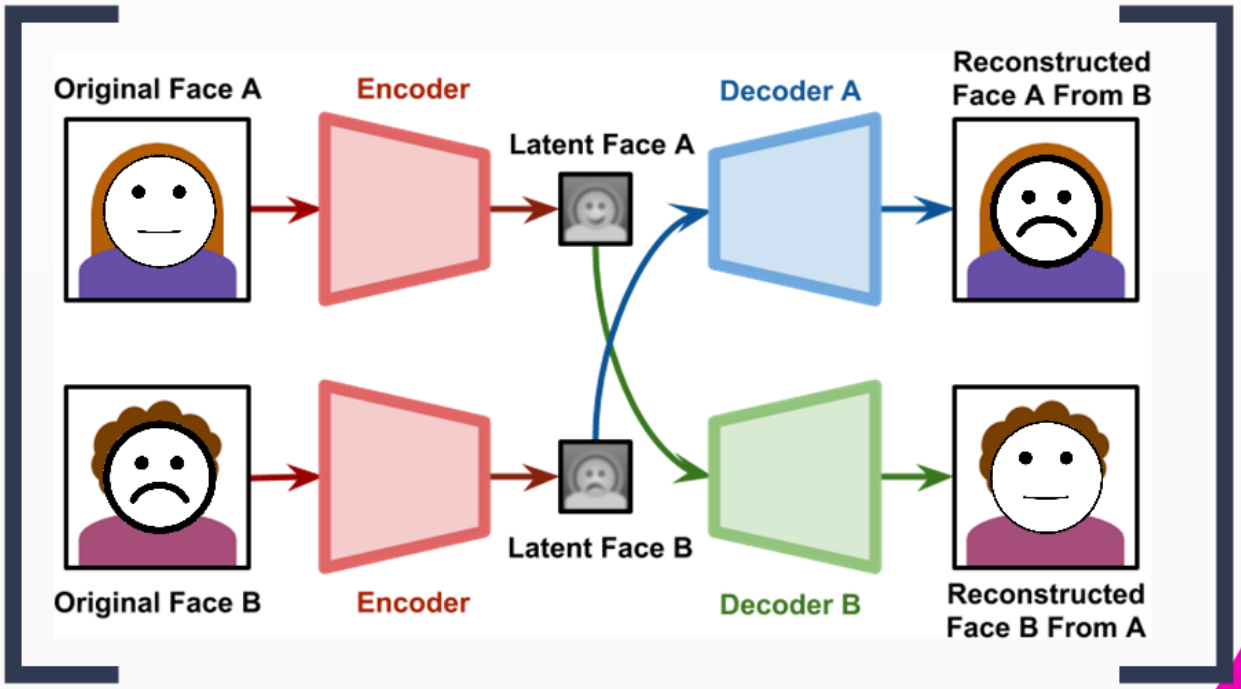
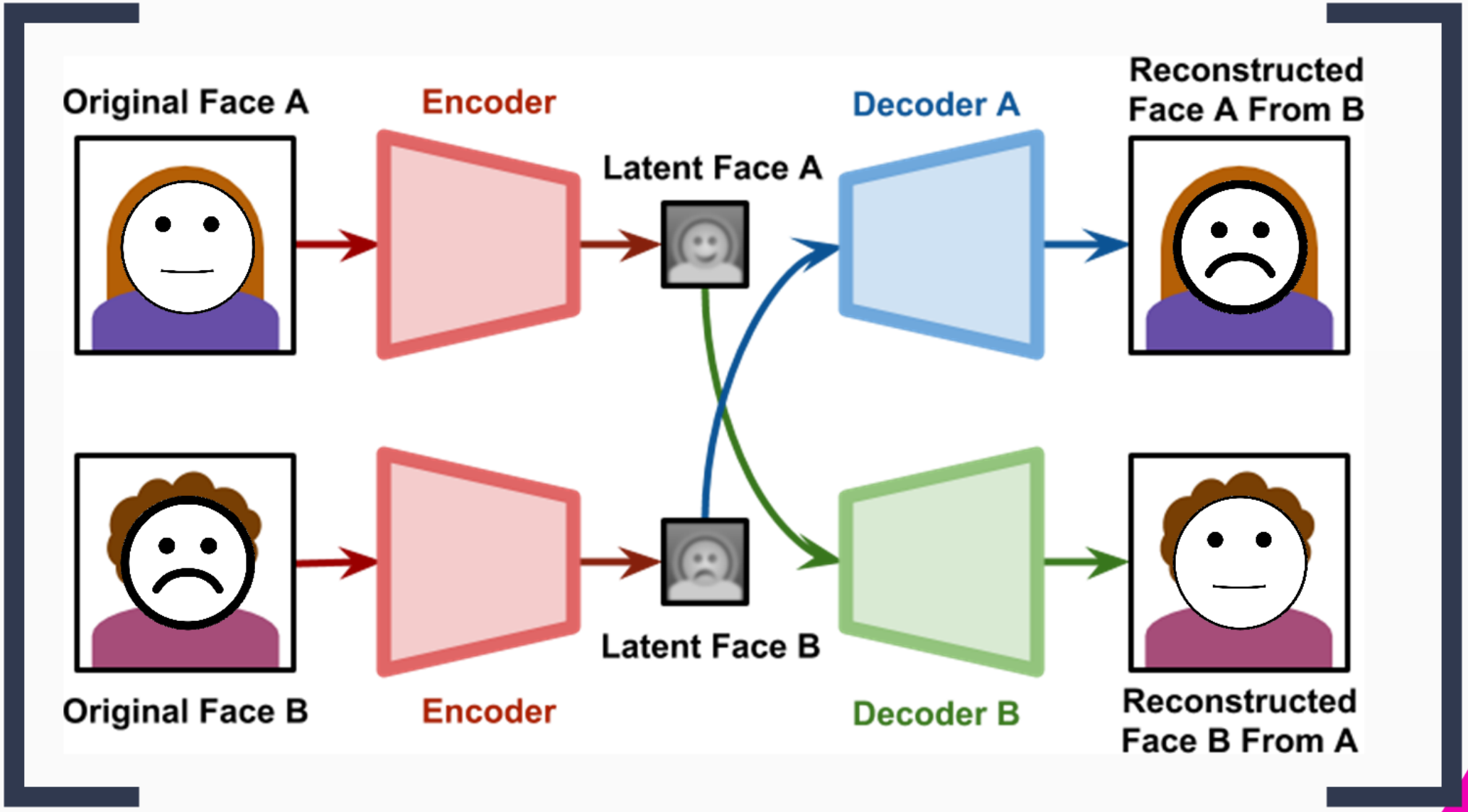
FVD

Deepfake Video Creation



Deepfake Video Creation



con... FVD

FVD By CNN

Generating and Training the model using the Deep Learning Convolution Neural Network ResNet50 model.

1. Input the dataset.
2. Applying preprocessing functions:
3. Preparing and dividing the data.
4. Training the model for classification of the data to real frames and fake frames.
5. Using the testing data to test and evaluate the output model.
6. Save the best model.

FVD By GAN

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con... FVD

FVD Based on Moving objects

we propose a model to detect the fake videos of the object-based type which are created by deleting or adding an item in the video. These videos are detected by the following some steps, namely:

1. Decompresses the video into a series of frames.
2. The background subtraction algorithm is applied to detect foreground objects.
3. We extract the forensic features from the sequential frames to detect the motion residuals.
4. The support vector machine classifier [4] is applied with the particle swarm optimization to minimize the loss of the trained data.
5. Determine if the video is fake or real.

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con... FVD

FVD by detecting Eye Blanking

Fake videos are generated using deep learning, so deep learning algorithms are the best way to detect these fake videos in addition to using optimization and Sentiment analysis technologies

1- Pre-processing
2- Long-term Recurrent Convolutional Networks (LRCN)
3- LRCN model training

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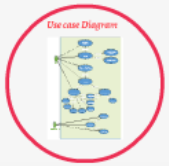

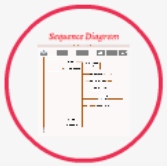

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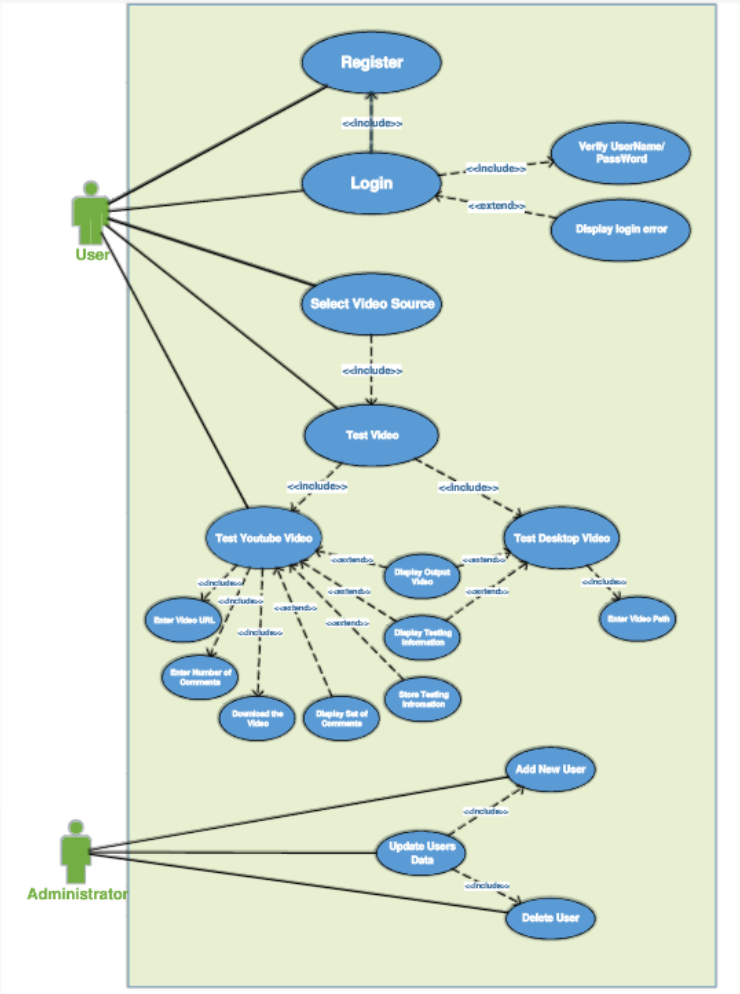
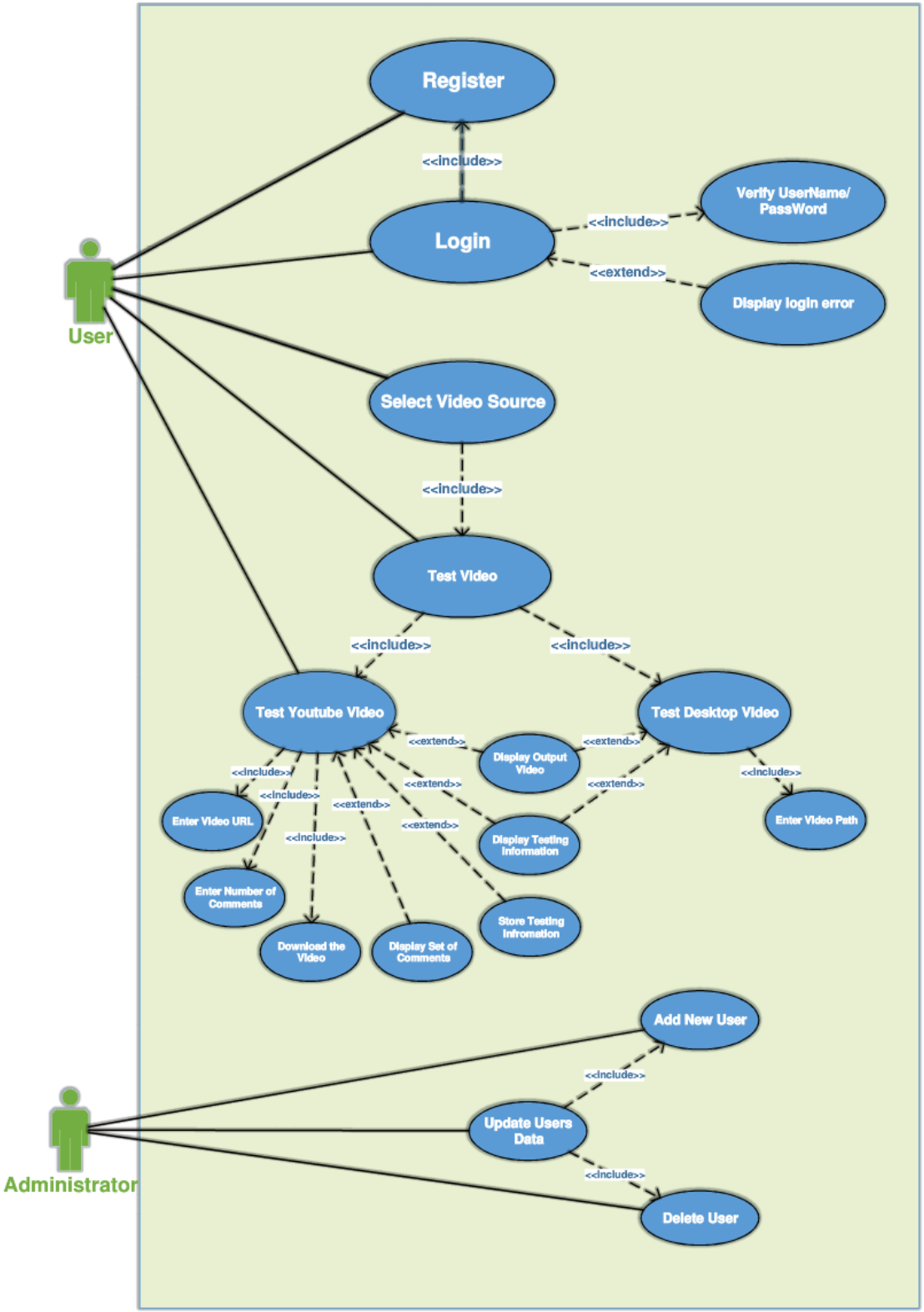
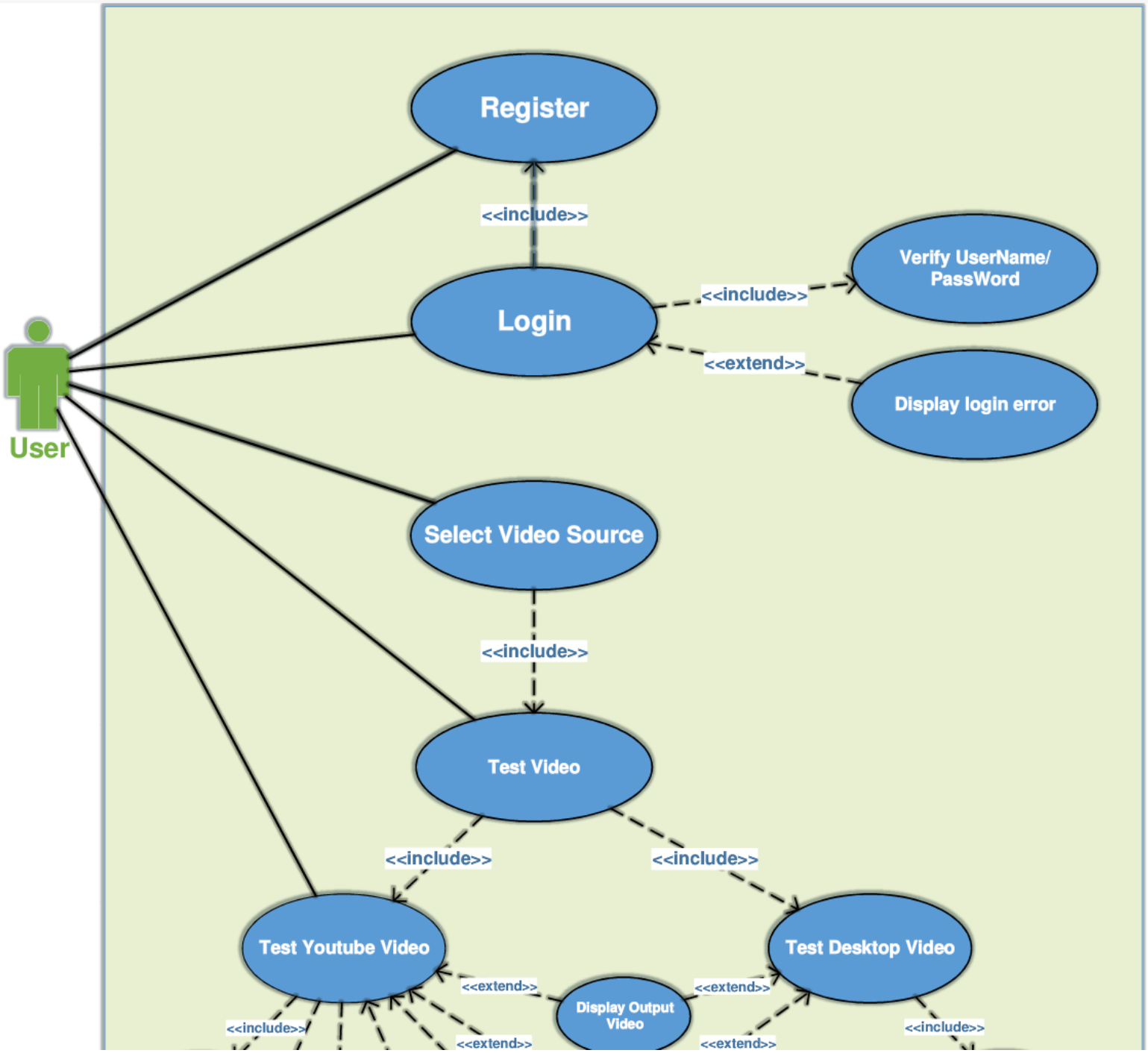
Use case Diagram




Register
<<include>>
Login
Verify UserName/ PassWord
<<include>>
<<extend>>
Display login error
User
Select Video Source
<<include>>
Test Video
<<include>>
<<include>>
Test Youtube Video
Test Desktop Video
<<extend>>
Display Output Video
<<extend>>
<<include>>
<<include>>
<<extend>>
<<extend>>
<<extend>>
<<include>>
Enter Video URL
Display Testing Information
Enter Video Path
<<include>>
Enter Number of Comments
Store Testing Infromation
Download the Video
Display Set of Comments
Add New User
<<include>>
Update Users Data
<<include>>
Administrator
Delete User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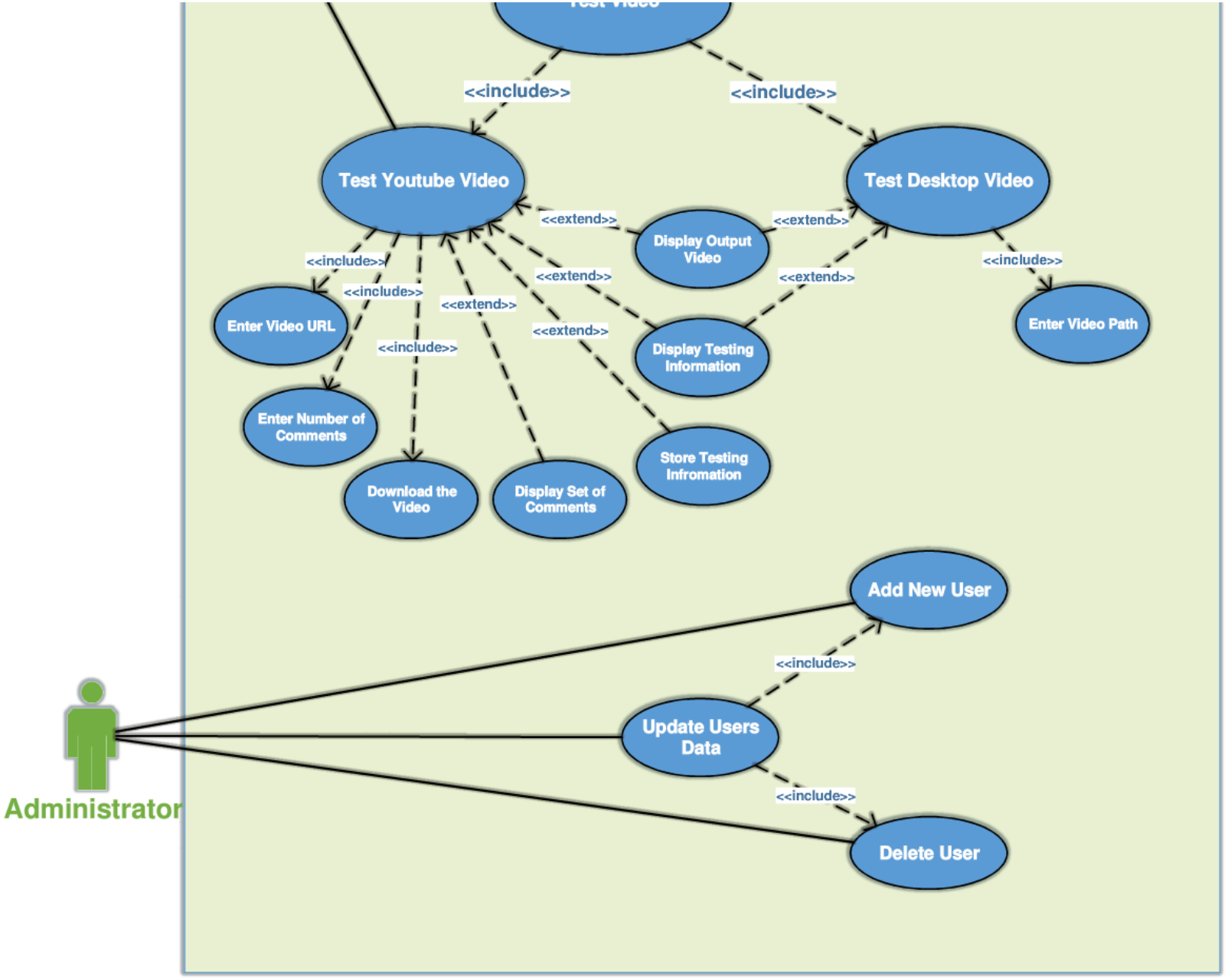
<<include>>
<<include>>
Test Youtube Video
Test Desktop Video
<<extend>>
<<extend>>
Display Output Video
<<include>>
<<include>>
<<extend>>
<<extend>>
<<include>>
<<include>>
<<extend>>
<<extend>>
Enter Video URL
Display Testing Information
Enter Video Path
<<include>>
Enter Number of Comments
Store Testing Infromation
Download the Video
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Add New User
<<include>>
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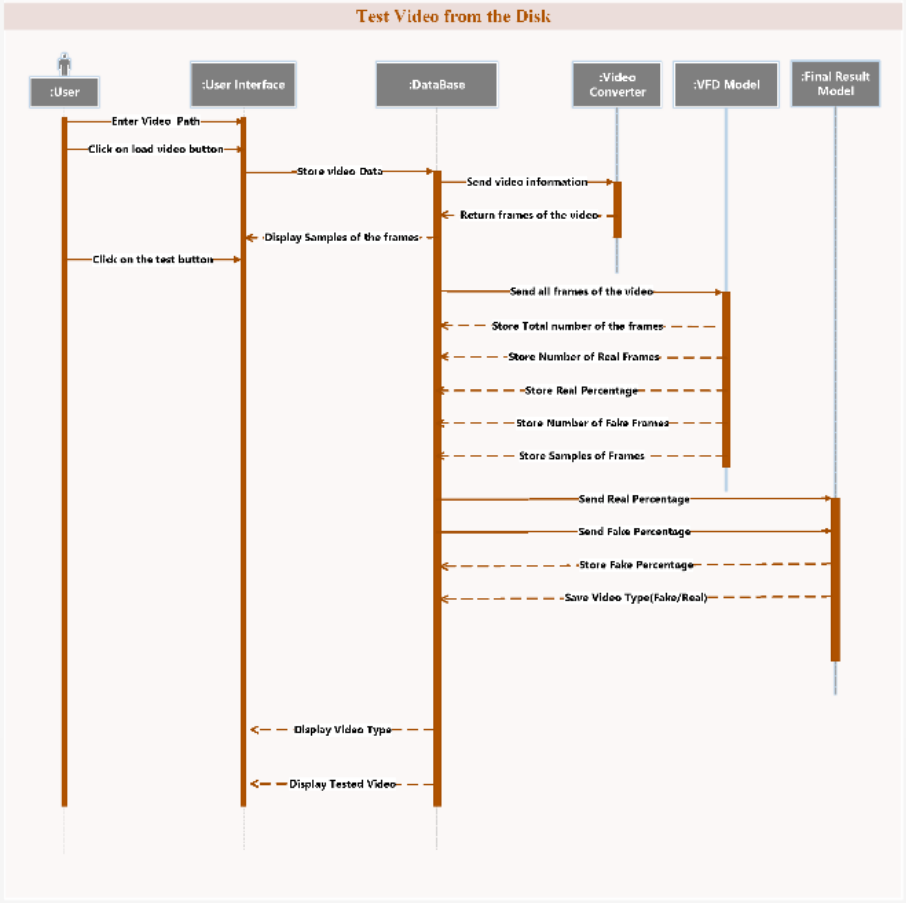
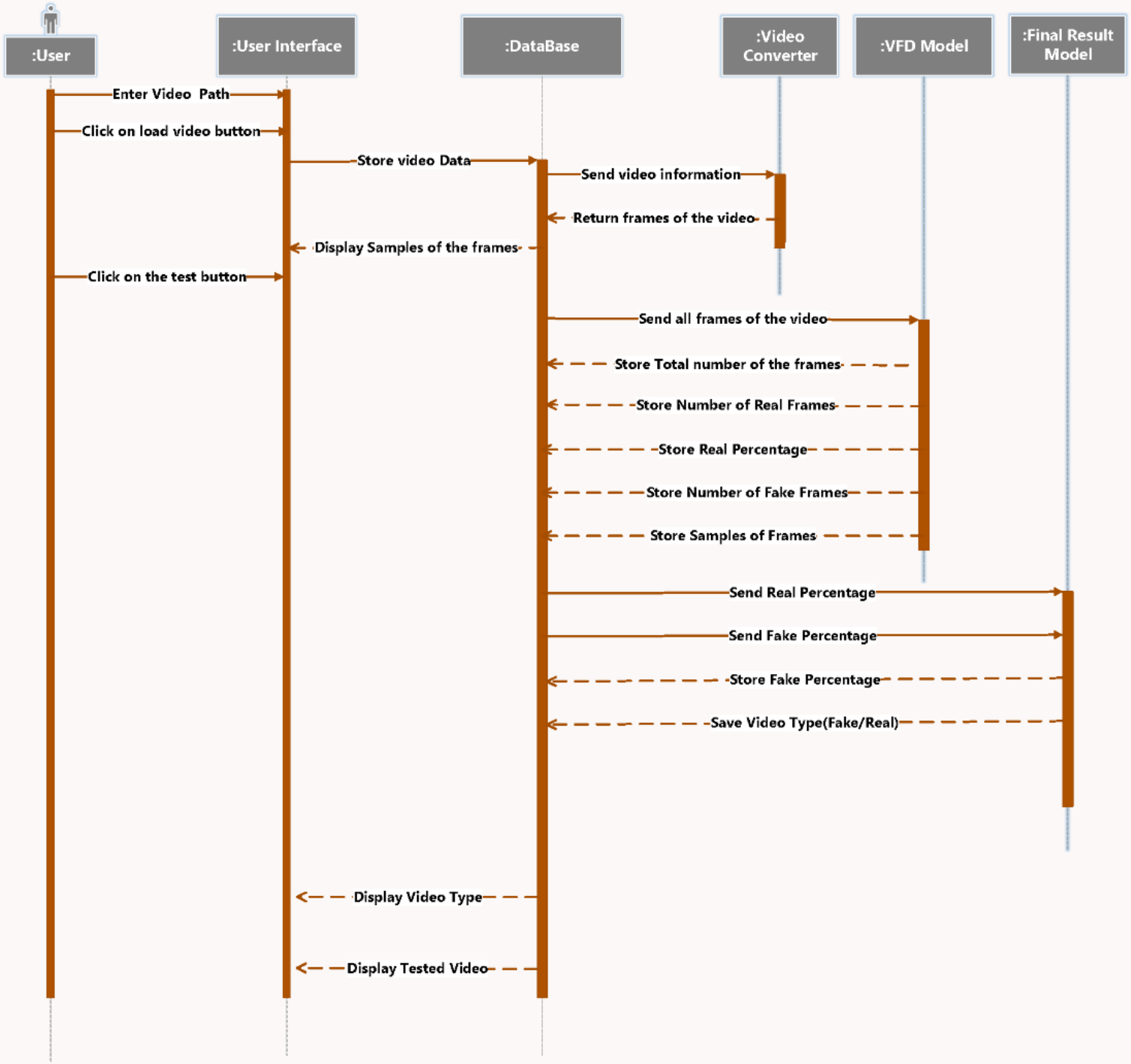
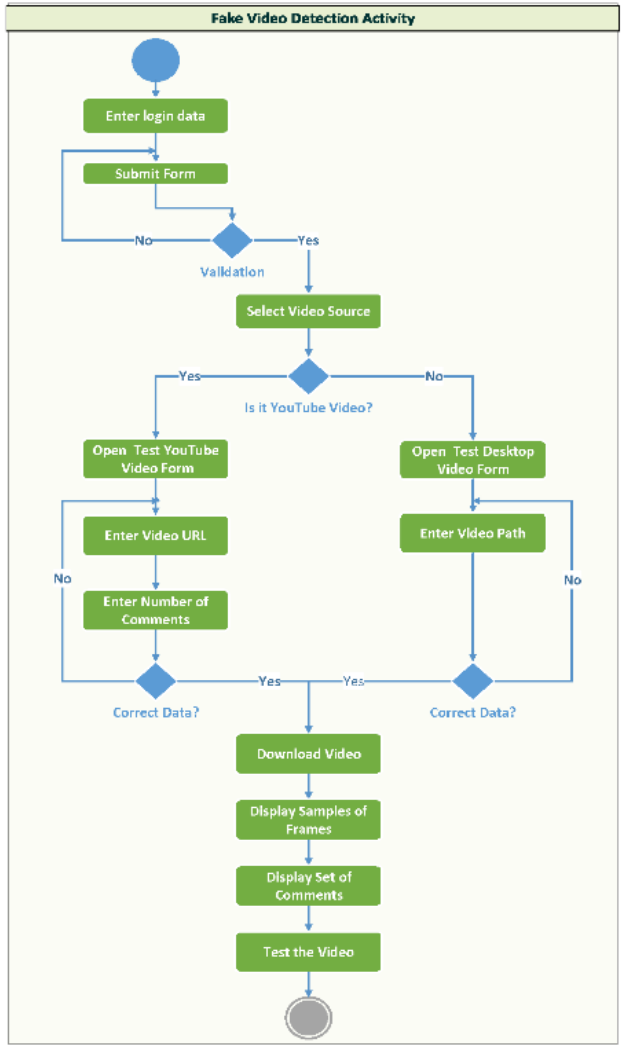
Sequence Diagram

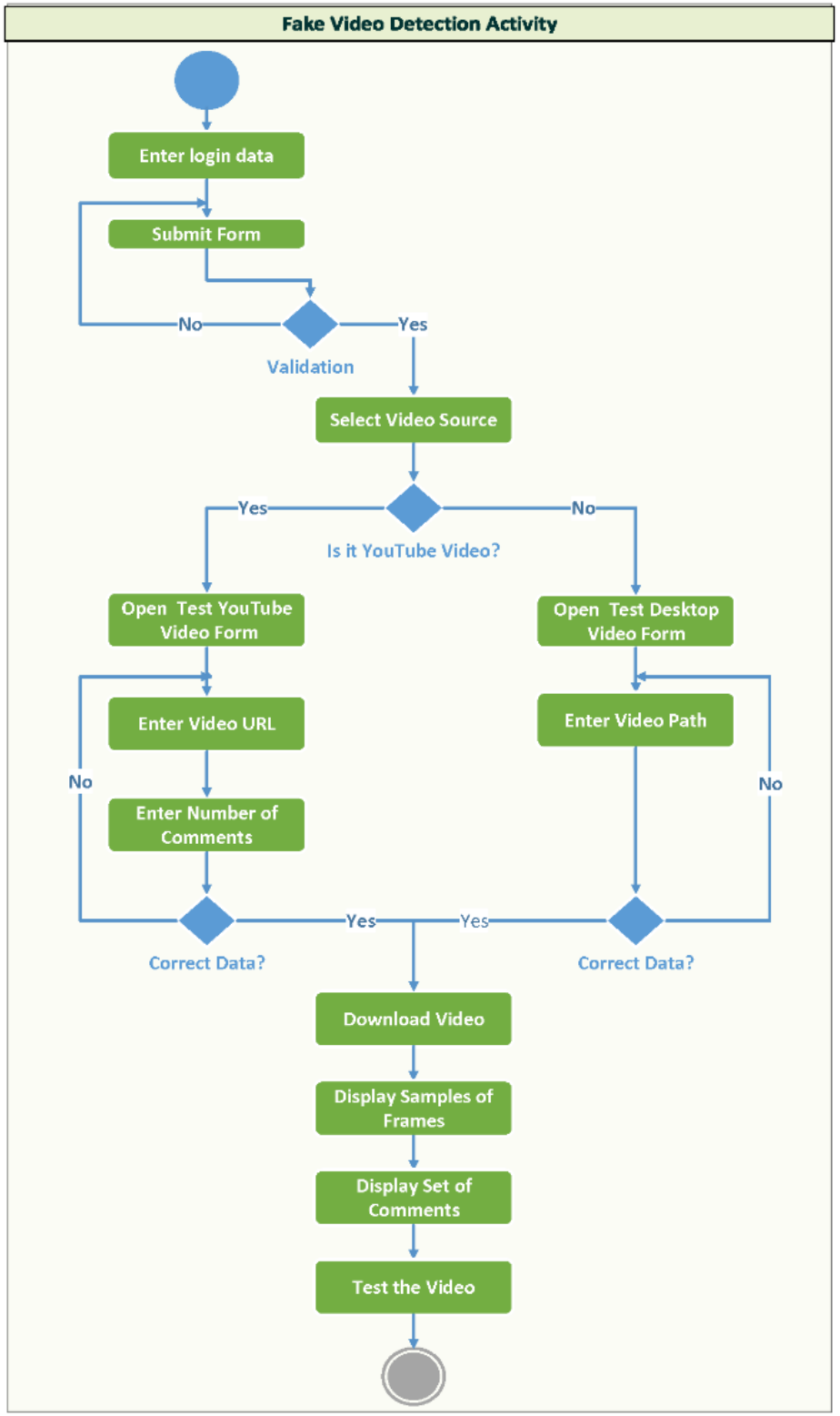


Test Video from the Disk

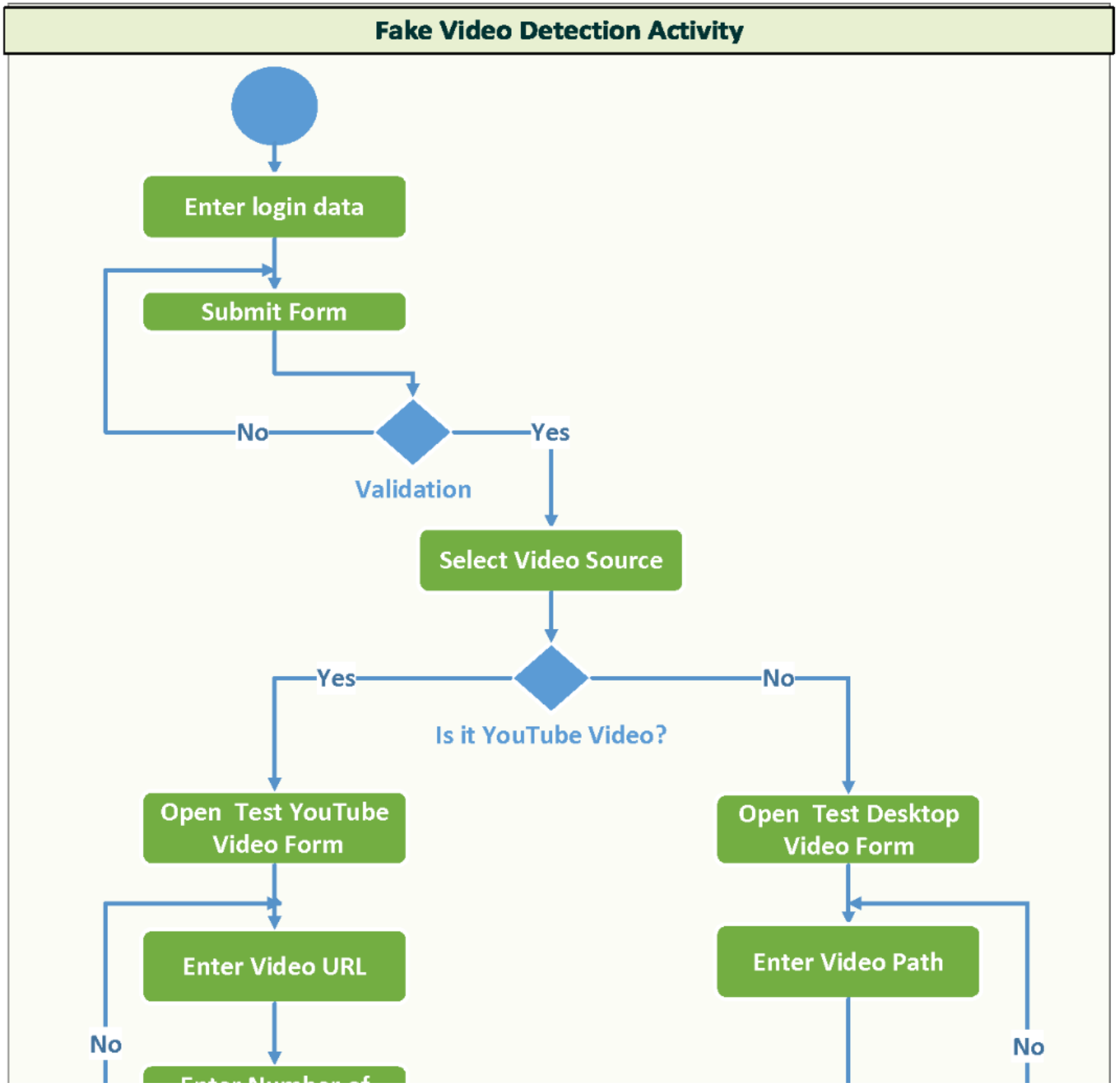


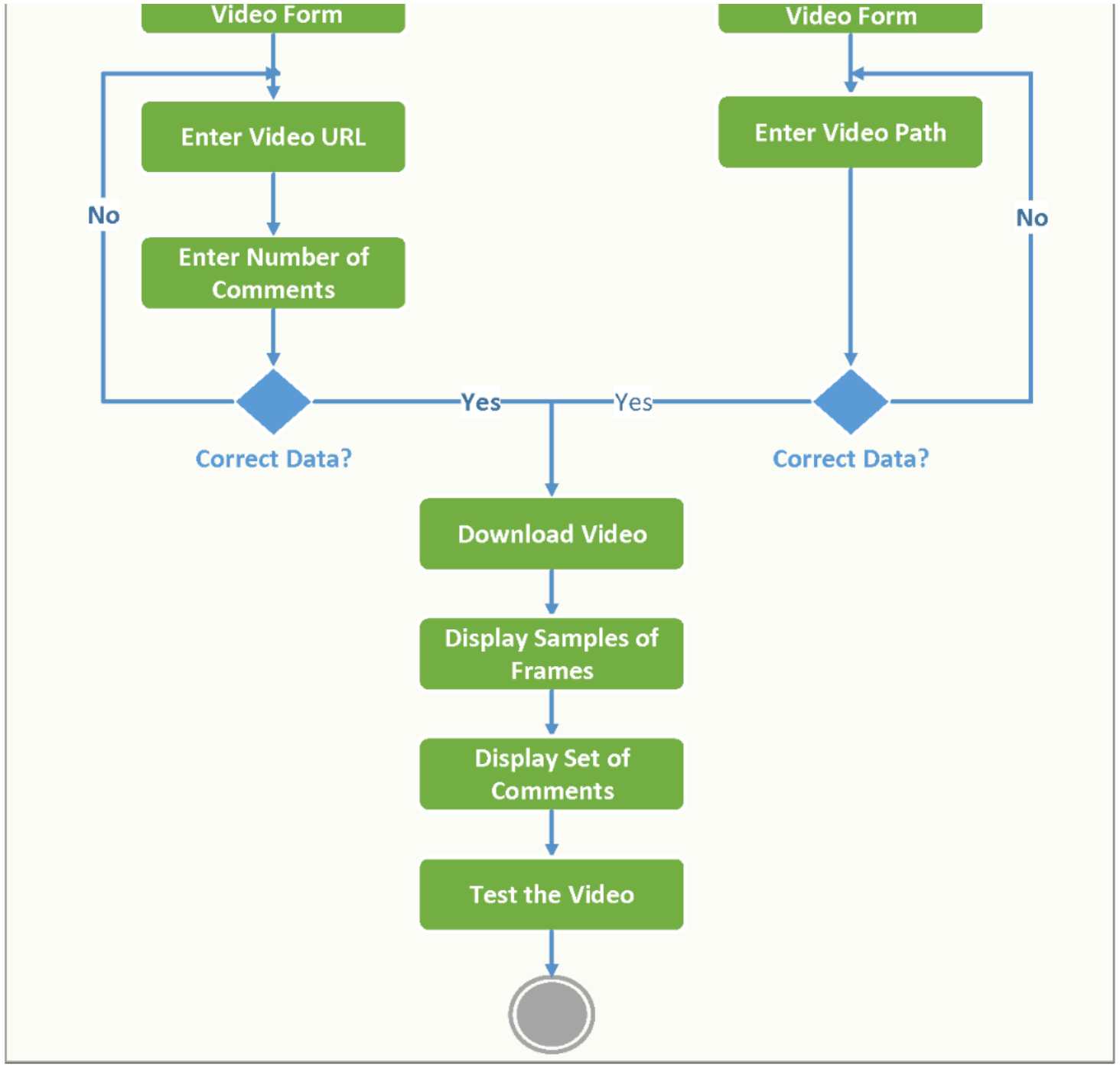
Activity Diagram




Fake Video Detection Activity
Enter login data
Submit Form
No
Yes
Validation
Select Video Source
Yes
No
Is it YouTube Video?
Open Test YouTube Video Form
Open Test Desktop Video Form
Enter Video URL
Enter Video Path
No
No
Enter Number of Comments
Yes
Yes
Correct Data?
Correct Data?
Download Video
Display Samples of Frames
Display Set of Comments
Test the Video

Activity Diagram




Video Form
Enter Video URL
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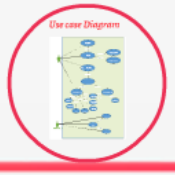

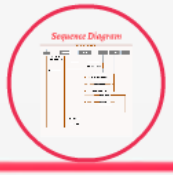

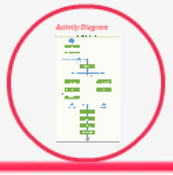

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