Ho Chi Minh City University of Technology
Faculty of Computer Science and Engineering

TEXT DETECTION AND RECOGNITION APPLICATION

Version: 4.2

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Member List:

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1. Introduction to project

Text, as one of the most influential inventions of humanity, has played an important role in human life, so far from ancient times. The rich and precise information embodied is very useful in a wide range of vision-based application, such as image research, target geolocation, human computer interaction, robot navigation…

In this project, we will deploy an application that can detect and recognize text. Also optimize the accuracy of the model due to the difficult task: diversity of scene text, complexity of background, inference factor…

2. Gerenal features of project

Feature 1: Detect text by using OpenCv's EAST model

Using camera to capture the image or take the image from the database. The system will check the existence of the image. If image don't exist, system will require you to choose another image. East model will help to detect and draw a boundary around the text.

Feature 2: Recognize text by using OpenCV's text recognition and Tesseract

Once we have the boundary around the text, system send it to the recognition part. In this part, the system recognize the boundary and write text above it.

Feature 3: Making File manage for user

User login to their account. There are three options for user to choose: select image, display history, exit app…

Feature 4: Detect text for video

Using VideoStream to catch each framework and use model to detect text.

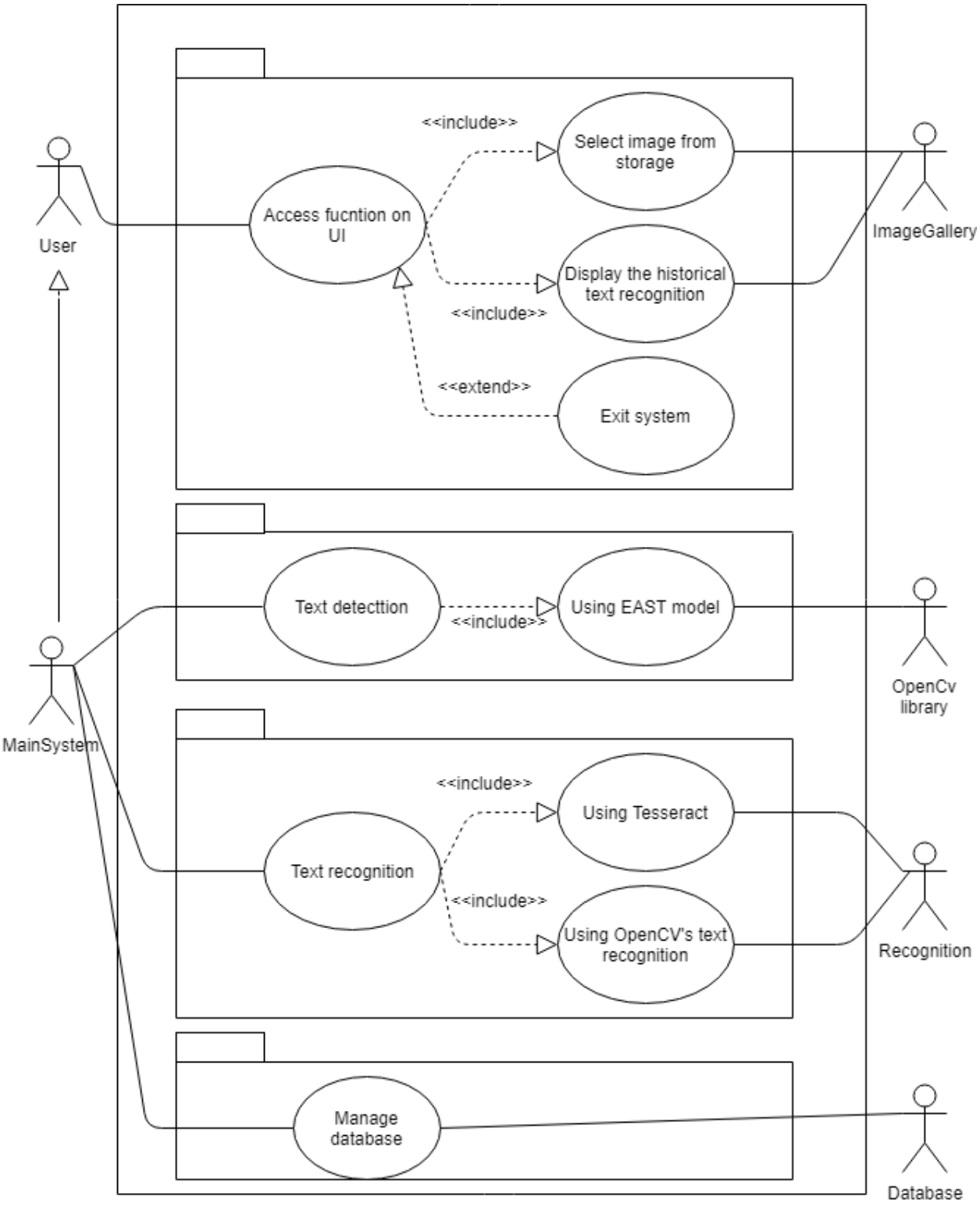
3. Non-functional features

Feature 1: The video detection system will reach the peak of its performance at 120fps

Feature 2: When working with large text, the system can reaches up to 95% accuracy

Feature 3: The text detection result comes out after 0.2s processing

4. Project's use case



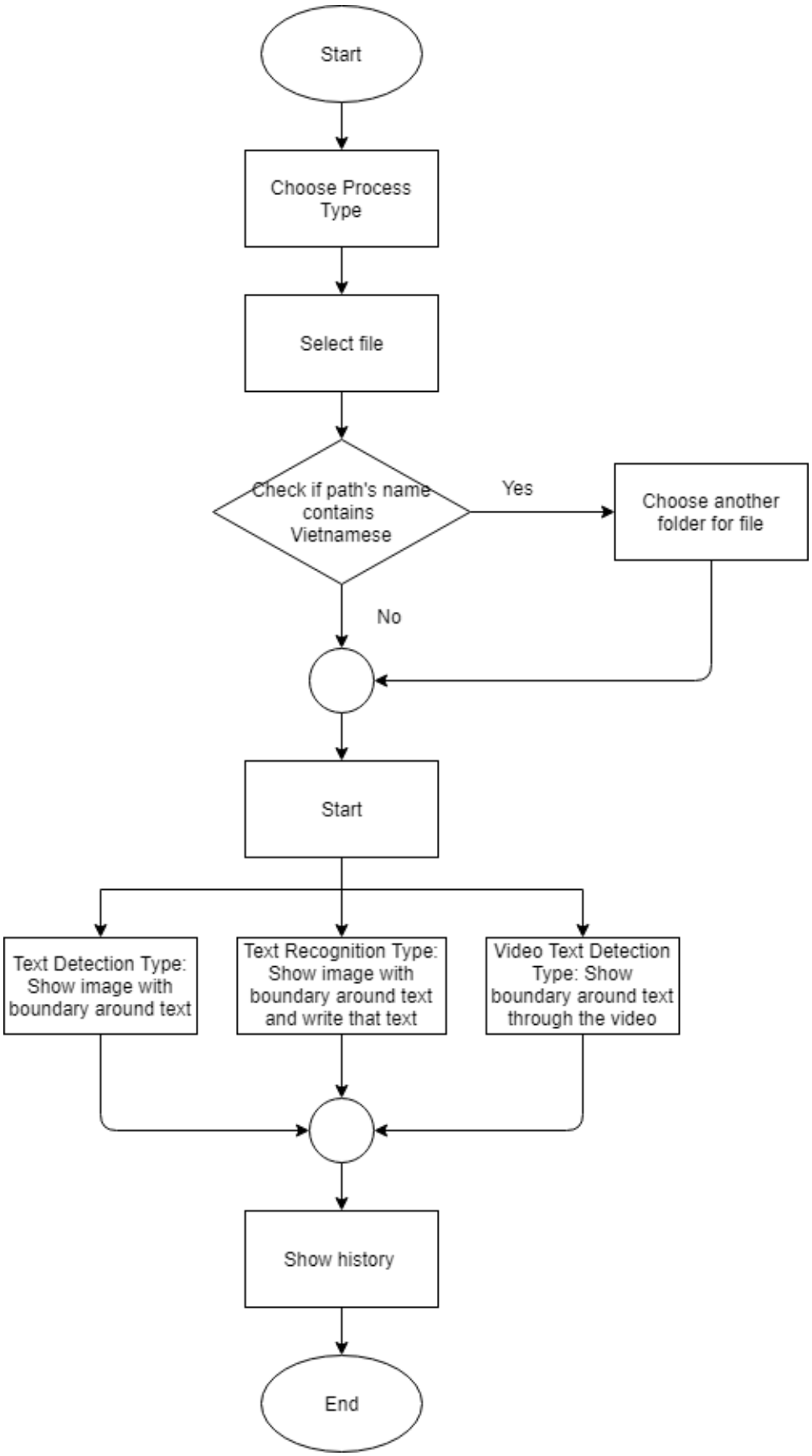
5. Work assignment

Member	Function
Nguyễn Trần Công Duy	File Manage
Cao Đức Hùng	Text Detection
Ngô Trọng Khôi	Text Recognition
Bùi Việt Minh Quân	Video Text Detection

6. Detailed features

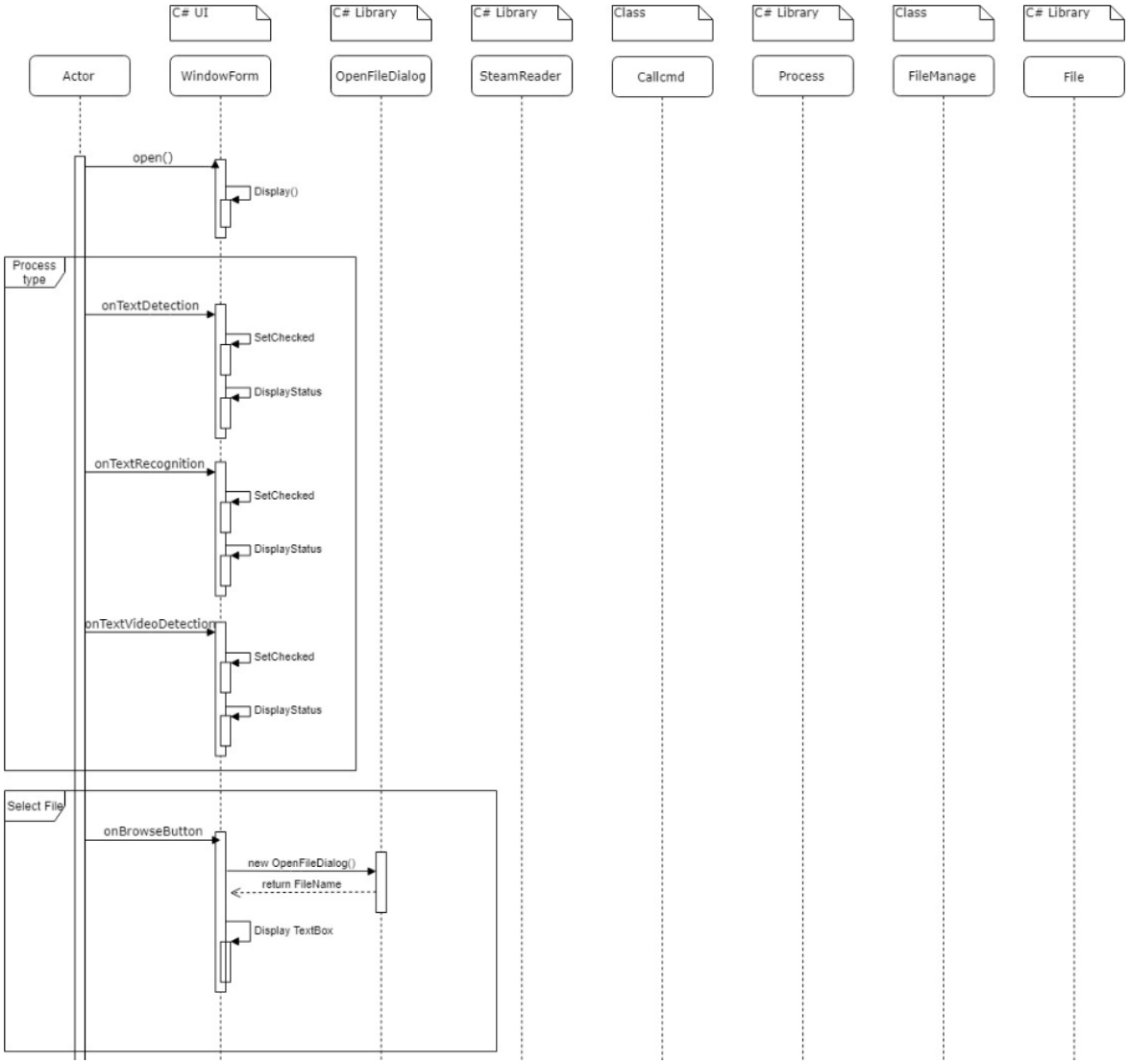
File Manage

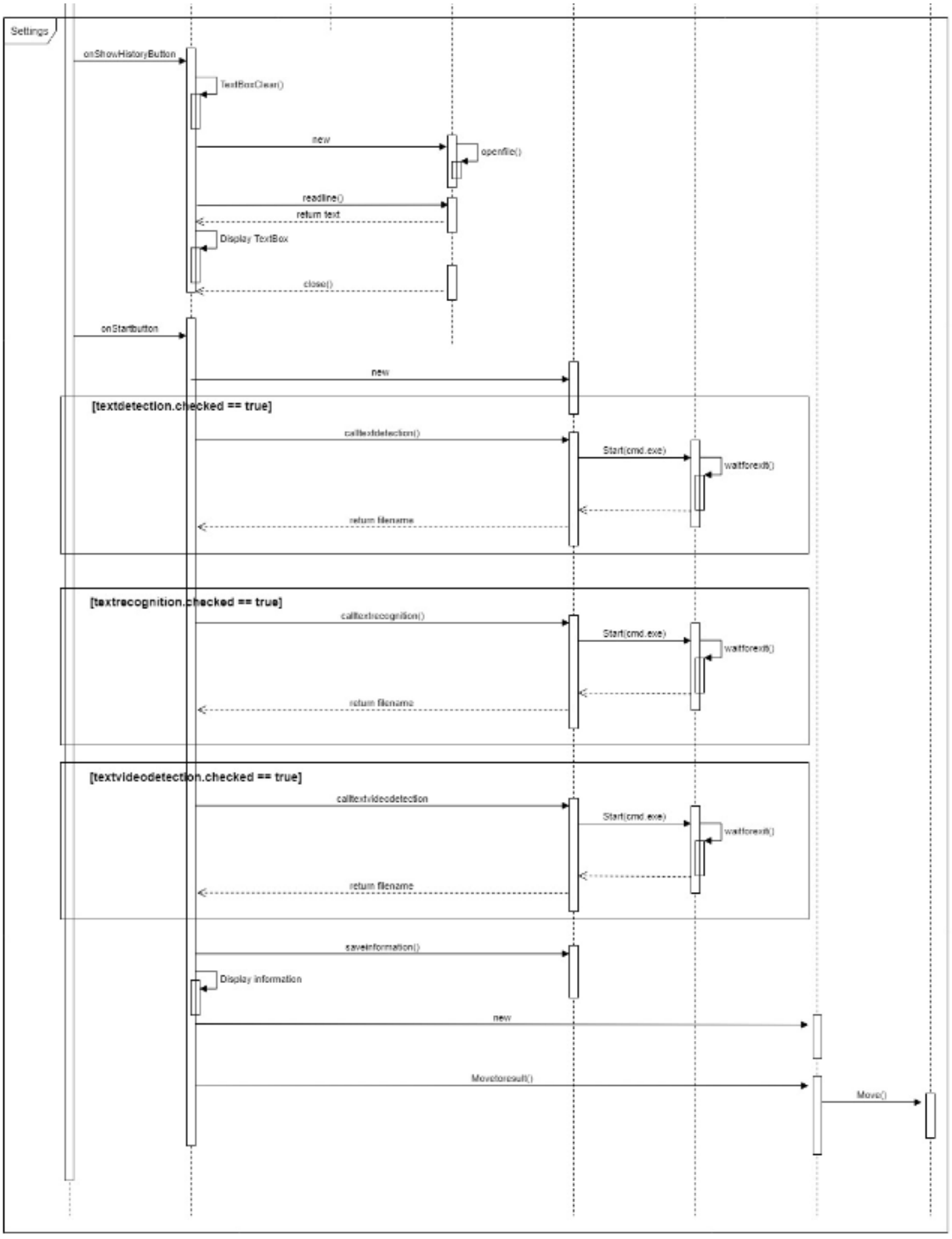
Use-case name	File Manage
Actor	User
Description	The user uses File manage to access to text-recognition application.
Preconditions	Database must be loaded.
Normal Flow	1. System displays text-recognition application UI. 2. User chooses the option the application: A. Select image from storage (from user's computer). B. Display historical text-recognition image. C. Exit. Case A: 3. User chooses the image from computer. 4. System call the Text-recognition function. 5. The return image from Text-recognition function is saved to database and showed to screen for the user. 6. User chooses exit, system goes to flow 2c. Case B: 3. System accesses to the database show the list of image's information (name, date, small image) have been processed already. 4. User chooses the image. 5. System show that image's information in large size. 6. User chooses exit, system goes to flow 2c. Case C: 3. System exits.


Start
Choose Process Type
Select file
Check if path's name contains Vietnamese
Yes
Choose another folder for file
No
Start
Text Detection Type: Show image with boundary around text
Text Recognition Type: Show image with boundary around text and write that text
Video Text Detection Type: Show boundary around text through the video
Show history
End

7. Diagrams

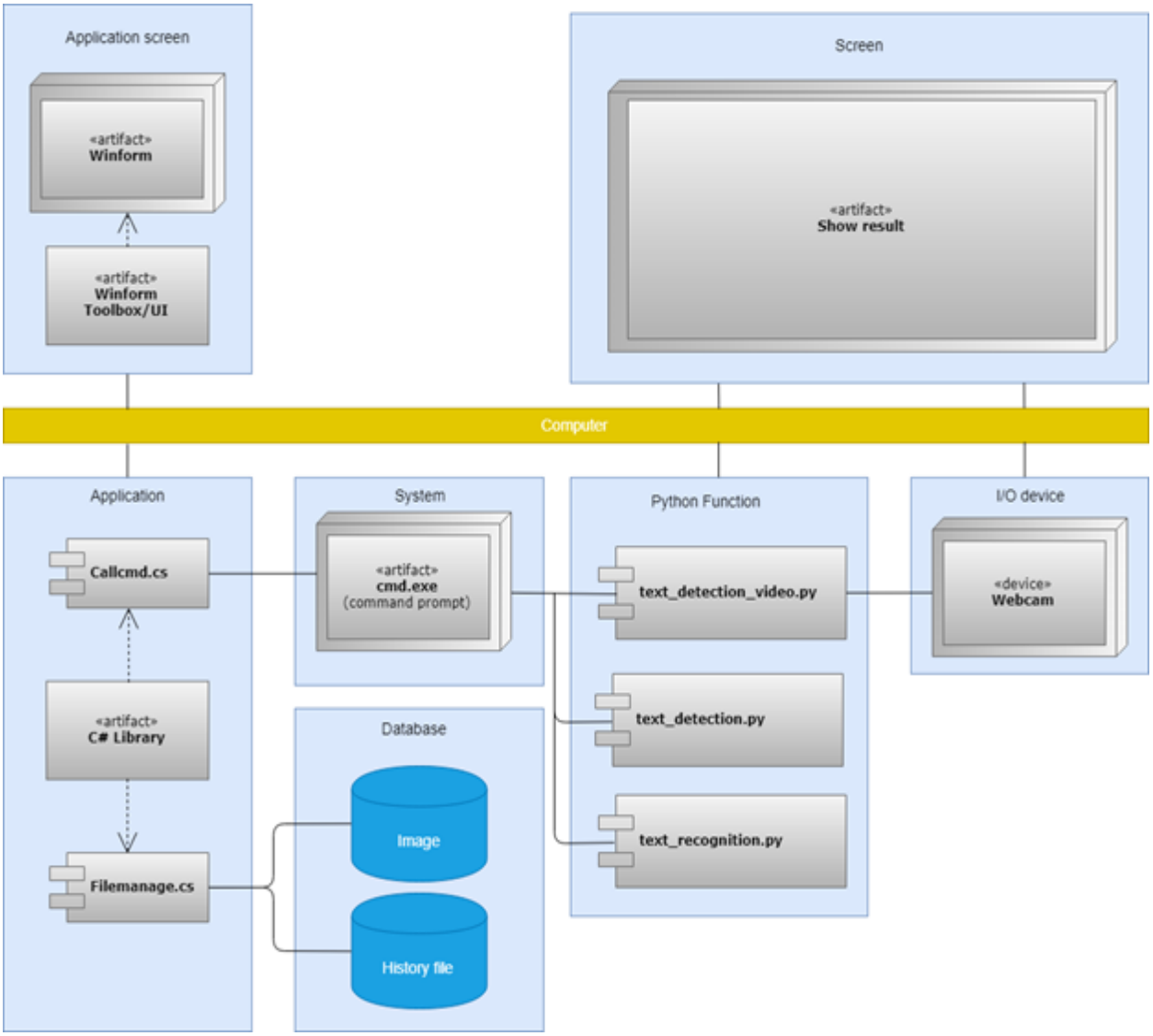
a. Sequence diagrams



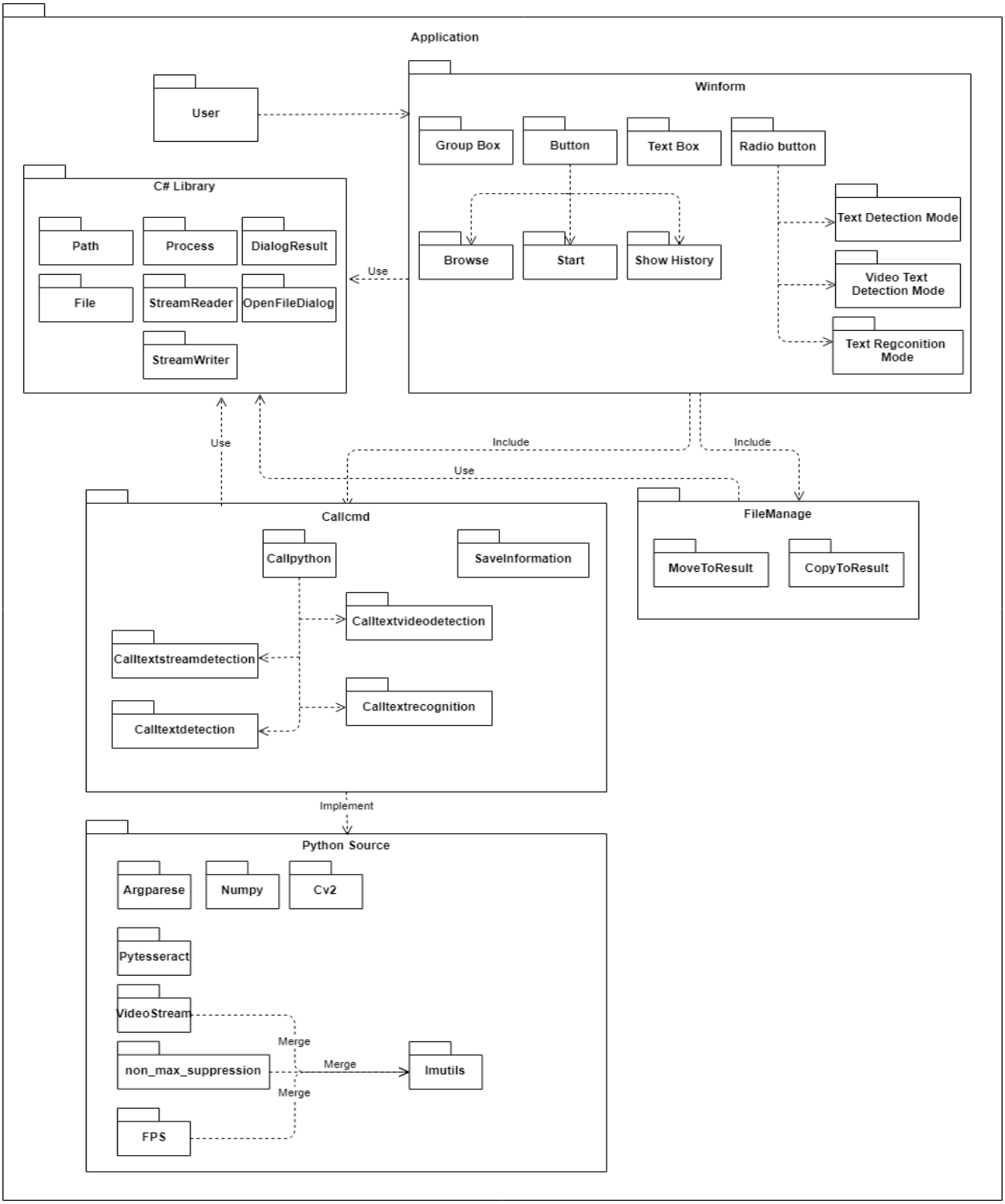

Settings
onShowHistoryButton
TextBoxClear()
new
openfile()
readline()
return text
Display TextBox
close()
onStartbutton
new
[textdetection.checked == true]
calltextdetection()
Start(cmd.exe)
waitforexit()
return filename
[textrecognition.checked == true]
calltextrecognition()
Start(cmd.exe)
waitforexit()
return filename
[textvideodetection.checked == true]
calltextvideodetection
Start(cmd.exe)
waitforexit()
return filename
saveinformation()
Display information
new
Movetoresult()
Move()

8. Software architecture design

a. Deployment view



b. Implementation view



9. Class Diagram