# Virtual ad-Space

## Software Design Document

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# 1 User's View

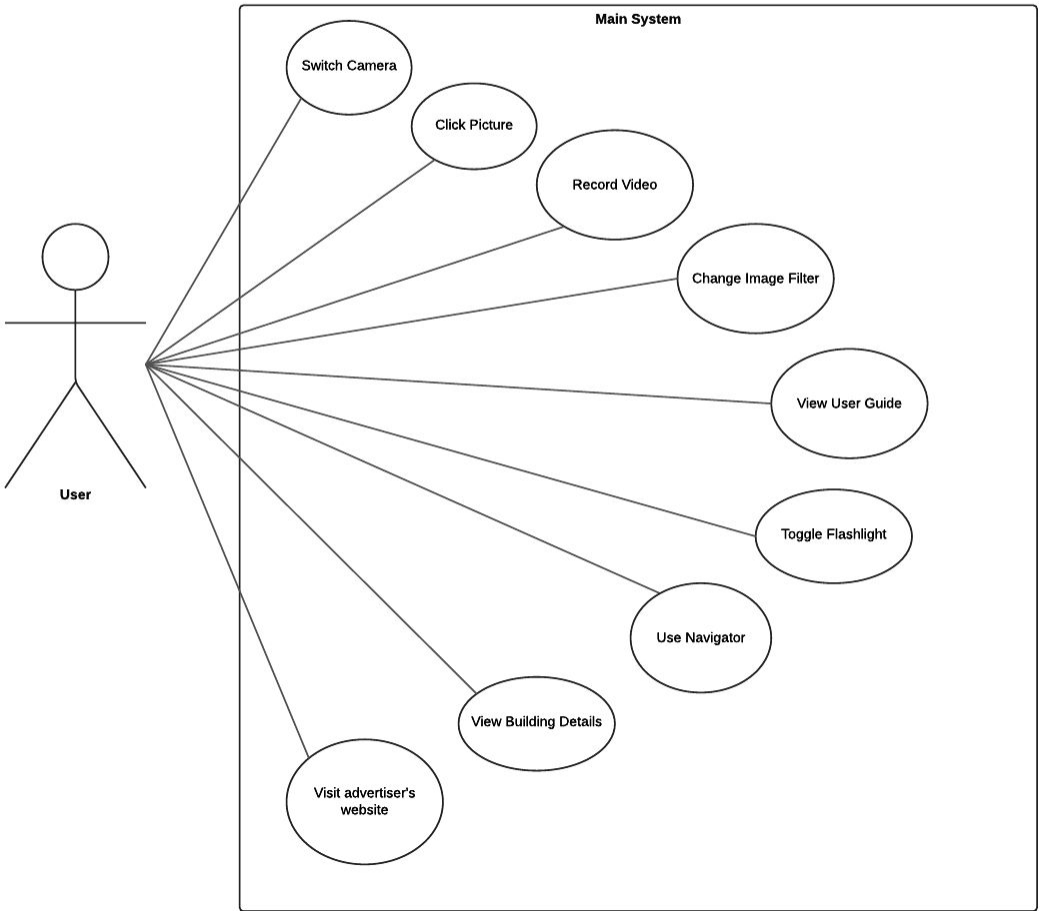
## 1.1 Actor Description

There is only actor present in the below described use case model who is none other than the user who uses the system .

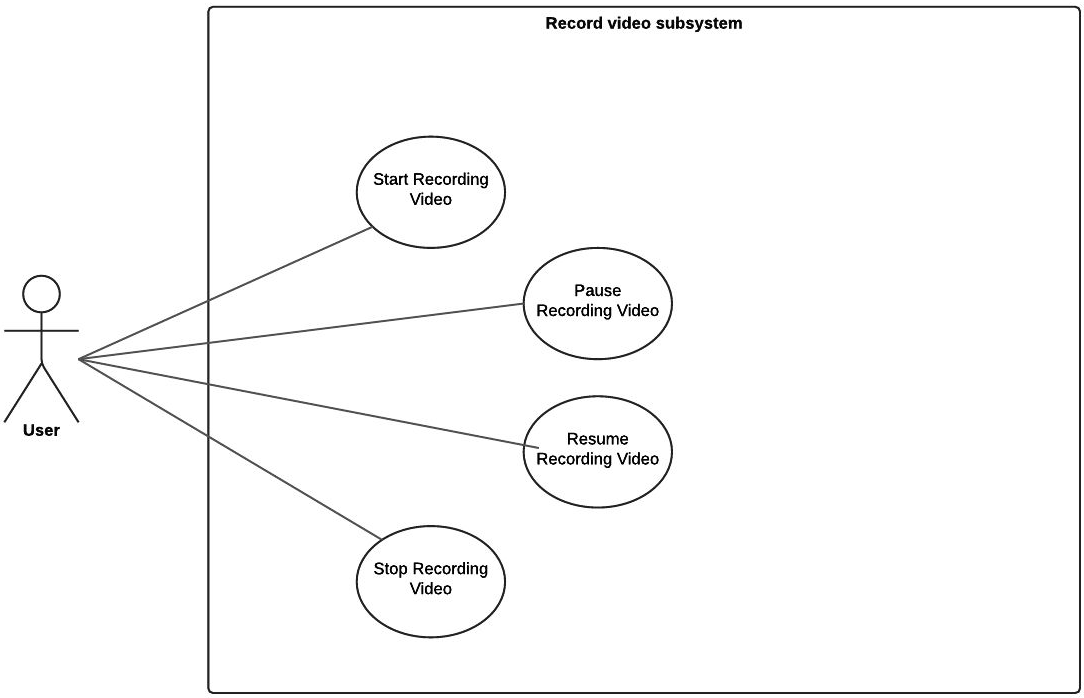
# 1.2 Use Case Diagram

Main System

**VIRTUAL AD SPACE USE CASE DIAGRAM**



Record Video Subsystem




## 1.3 Listing of the use cases:

1) Switch Camera
2) Click Picture
3) Record Video
    a. Start Recording Video
    b. Pause Recording Video
    c. Resume Recording Video
    d. Stop Recording Video
4) Change Image Filter
5) View User Guide
6) Toggle Flashlight
7) View Building details
8) Visit Advertiser's Website
9) Use navigator

## 1.4 Description of each use case:

**U1) Switch Camera** : Using this use case ,the user will be able to toggle the present state of the camera.

Scenario 1 : Mainline Sequence :

1) User : Clicks on Switch Camera option
2) System : Switches the Camera being used

Scenario 2 : at step 2 of the Mainline Sequence

2) System : Cannot access desired camera. Displays error and continues normal activity with current camera.

**U2) Click Picture : ** Using this use case ,the user will be able to capture desired image and save it in the gallery .

Scenario 1 : Mainline Sequence :

1) User : Clicks on the Capture Image option.
2) System : Stores Camera Frame and shows captured image on screen for 3 seconds

Scenario 2 : at step 2 of the Mainline Sequence

2) Storage : Storage is full. System displays error message that it cannot store the image as storage is full.

**U3) Record Video : ** This use case enables the user to record a video by pausing and resuming in between whenever he wishes to.

4.1 Start Recording Video:

Scenario 1 : Mainline Sequence

1) User : Clicks on record video option.
2) System : Records the camera stream until the user pause or stop the recording.

Scenario 2 : at step 2 of the Mainline Sequence

2) Storage : Storage is full. System displays error message that it cannot record the video as storage is full.

4.2 Pause Recording Video:

Scenario 1 : Mainline Sequence

1) User : Clicks on the Pause option on the display while the video is being recorded .
2) System : Pause the recording and replaces the Pause option by Resume option

4.3 Resume Recording Video

Scenario 1 : Mainline Sequence

1) User : Clicks on the Resume option on the display
2) System : System resumes the recording.

4.4 Stop Recording Video

Scenario 1 : Mainline Sequence

1) User : Click on the stop option
2) System : Stop the recording and return to Normal Display

**U4) Change Image Filter :** Using this use case the user will be able to apply desired filter to the upcoming camera stream.

Scenario 1 : Mainline Sequence :

1) User : Clicks on the “Filters” option
2) System : Displays a menu/list of filters available with corresponding mini-sized filtered image
3) User : Selects desired Image Filter option from the Filter List.
4) System : Applies filter permanently, and all next frames will be seen with this Filter

**U5) View User Guide :** This use case enables the user to know about different functionalities of the system and the way to use them.

Scenario 1 : Mainline Sequence:

1) User : clicks the help option.
2) System : displays the guide with a list of topics.
3) User : selects a topic
4) System : Displays the information needed to guide on the selected topic.

**U6) Toggle Flashlight :** Using this use case ,the user will be able to toggle the present state of the system.

Scenario 1 : Mainline Sequence:

1) User : Selects toggle Flashlight option
2) System : Toggles the state of the flashlight

Scenario 2 : at step 2 of the Mainline Sequence

2) System : Displays error message when the it fails to connect to the flashlight .

**U7) View building details:** User will be use this use case only when the system detects a IITG building when the camera is pointed to it.This use case enables the user to view the interior map of the building

Scenario 1 : Mainline Sequence:

1) User : clicks on the name of the building which appears on the screen along with the advertisement when the building is detected by the system.
2) System : shows the 2D image representing the interior map of the building.
3) User : selects an option to return back.
4) System : system enters into the previously operating mode.

**U8) Visit advertiser's website :** Using this use case the user will be able to visit the advertiser's site by clicking on the advertisement .

Scenario 1 : Mainline Sequence:

1) User : clicks on the advertisement.
2) System: redirects user to advertiser's website opened in default browser of user's system.

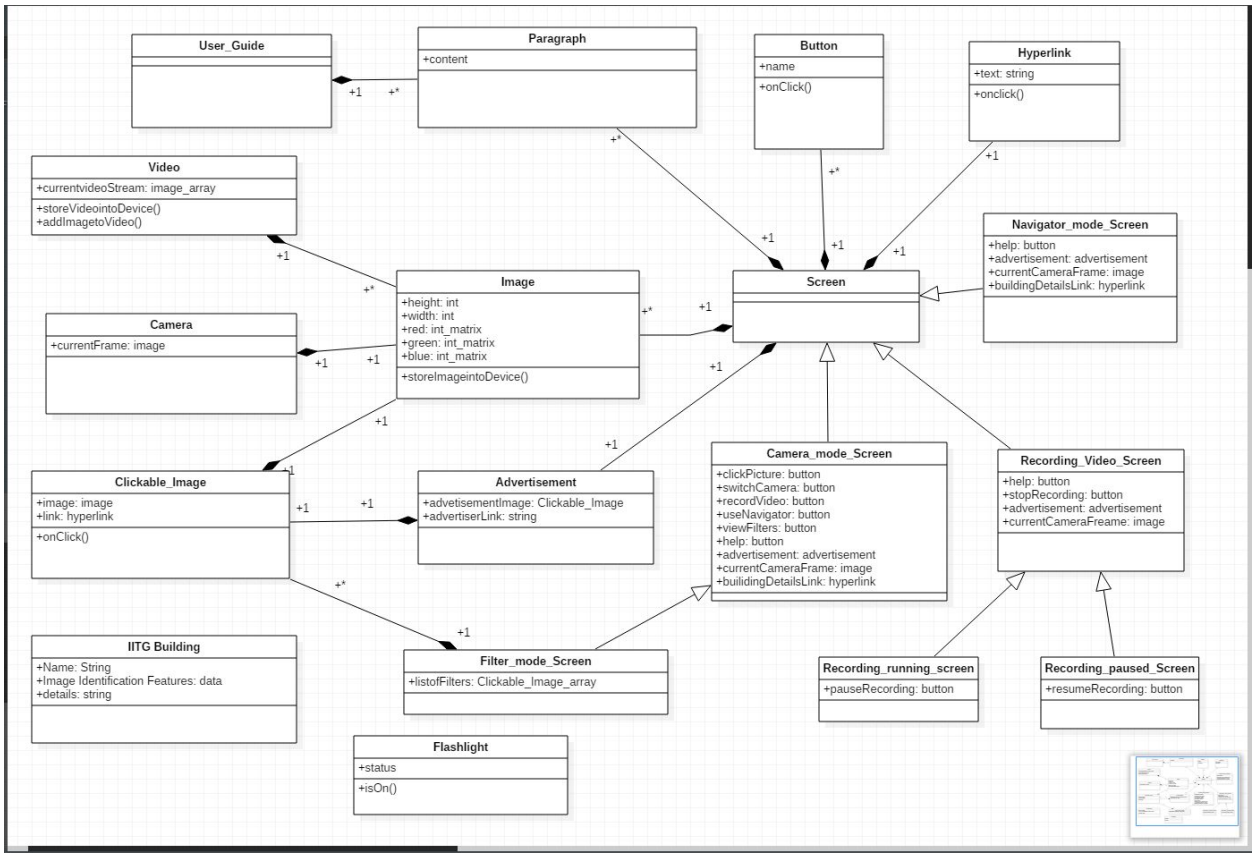
**U9) Use Navigator :** Using this use case the user will be able to navigate through the campus just by setting up the destination and pointing the camera towards the nearby buildings

Scenario 1 : Mainline Sequence :

1) User : Selects the navigator option.
2) System : Displays a list of buildings and asks to choose the desired destination.
3) User : Selects the desired destination.
4) System : Enters into the navigator mode in which it gives the directions when the user points the camera towards a IITG building.

**Normal State of System** : When the system is in the normal state ,it pops up an advertisement along with the name whenever it identifies an IITG building and displays normal camera mode UI.

Structural View
Class Diagram




Boundary and Entity Classes

Description of Classes

**Class Name - Image**

Attributes :

- height (int) : Number of Pixels of the Image Vertically.
- width (int) : Number of Pixels of the Image Horizontally
- Red (int matrix) : Matrix of the size [height x width]. Each Element of this Matrix represent red color of the picture with values ranging (0-255)

- Green (int matrix) : Matrix of the size [height x width]. Each Element of this Matrix represent green color of the picture with values ranging (0-255)
- Blue (int matrix) : Matrix of the size [height x width]. Each Element of this Matrix represent blue color of the picture with values ranging (0-255)

Method :

- storeImageintoDevice() : This function of the Image Class will store the Image into Device Storage

It is an *Entity Object*

**Class Name - HyperLink**

Attributes :

- text (string) : This attribute contains the current ongoing camera frame

Methods :

- onClick() : This method will redirect the user

It is an *Entity Object*

**Class Name - Clickable_Image**

Attributes :

- Image (image) : An Image which is Clickable
- link (hyperlink) : The link where to redirect on clicking the image

Methods :

- onClick() : This function will redirect according to link attribute's hyperlink name.

**Class Name - Camera**

Attributes :

- currentFrame (image) : This attribute contains the current ongoing camera frame

It is an *Entity Object*

**Class Name - Video**

Attribute:

Methods :

- storeVideointoDevice () : This method will store the streaming camera frame into the device
-

It is an *Entity Object*

**Class Name - Flashlight**

Attributes :

- status (bool) : This attribute tell the status of the Flashlight

Methods :

- isOn() (bool) : This Method checks the status of the Flashlight whether it is switched on or off

It is an *Entity Object*

**Class Name - Camera_mode_Screen**

Attributes :

- clickPicture (button) : This button will store the current Camera Frame in the Storage
- switchCamera (button) : On clicking this button the Camera will toggle/ Switch
- recordVideo (button) : On clicking this button video will start recording
- useNavigator (button) : On clicking this button the App will go to Navigator mode
- applyFilters (button) : On clicking this button List of all the Filter will appear on the screen
- help (button) : Shows user help/Guide
- Advertisement (advertisement) : This attribute will redirect the User to Advertiser's Link
- cameraFrame (image) : This attribute contain the Camera Frame which can be with the Advertisement will be shown to the user
- buildingDetailLink (hyperlink) : Links this attributes with Building details

It is an *Boundary Object*

**Class Name - Advertisement**

Attributes :

- advertisementImage (Clickable_Image) :
- advertiserLink (string) :

It is an *Entity Object*

**Class Name - IITG Building**

Attributes :

- Name (hyperlink) : This is an attribute which is linked to the details of the building
- Image Identification Feature (Data) : This attributes contain the Image data of every building
- Details (string): This contains the Name of the Building

It is an *Entity Object*

**Class Name - Navigator_mode_Screen**

Attributes :

1) help (button) : Attribute will show the guidelines to use the Navigator mode
2) advertisement (advertisement) : The Advertisement which is shown on the Screen. On clicking on the advertisement, the user will be Redirected to the Advertisers Link
3) currentCameraFrame (Image) : the current camera frame which is shown on the display
4) buildingDetailsLink (hyperlink) : On clicking this link the user will be directed to the building details

It is an *Boundary Object*

**Class Name - Recording_Video_Screen**

Attributes :

1) help (button) : Users guide for the App

2) stopRecording (button) : On clicking this button the recording of the video will be stopped
3) advertisement (advertisement) : The Advertisement which is shown on the Screen. On clicking on the advertisement, user will be directed to Advertiser's Link
4) currentCameraFrame (Image) : the current camera frame which is shown on the Display

It is an *Boundary Object*

**Class Name - Recording_Running_Screen**

Attributes :

- pauseRecording (button) : On clicking this button the video which is being recorded will be paused

It is an *Boundary Object*

**Class Name - Recording_Pause_Screen**

Attributes :

- resumeRecording (button) : On clicking the button, the video recording which was paused before will start recording again

It is an *Boundary Object*

**Class Name - Filter_mode_Screen**

Attributes :

- listofFilters (Clickable Image array) : The Attribute contain the list of all the Filters provided by the App and contain the small sized Filtered Image. When the user click on the desired Filter, the filter will apply permanently untill the user change it

It is an *Boundary Object*

**Class Name - Button**

Attributes :

- Name : Name of the Button

Methods :

- onClick() : On clicking the button, it signals other classes to Function correspondingly

It is a *Boundary Object*

**Class Name - Paragraph**

Attributes :

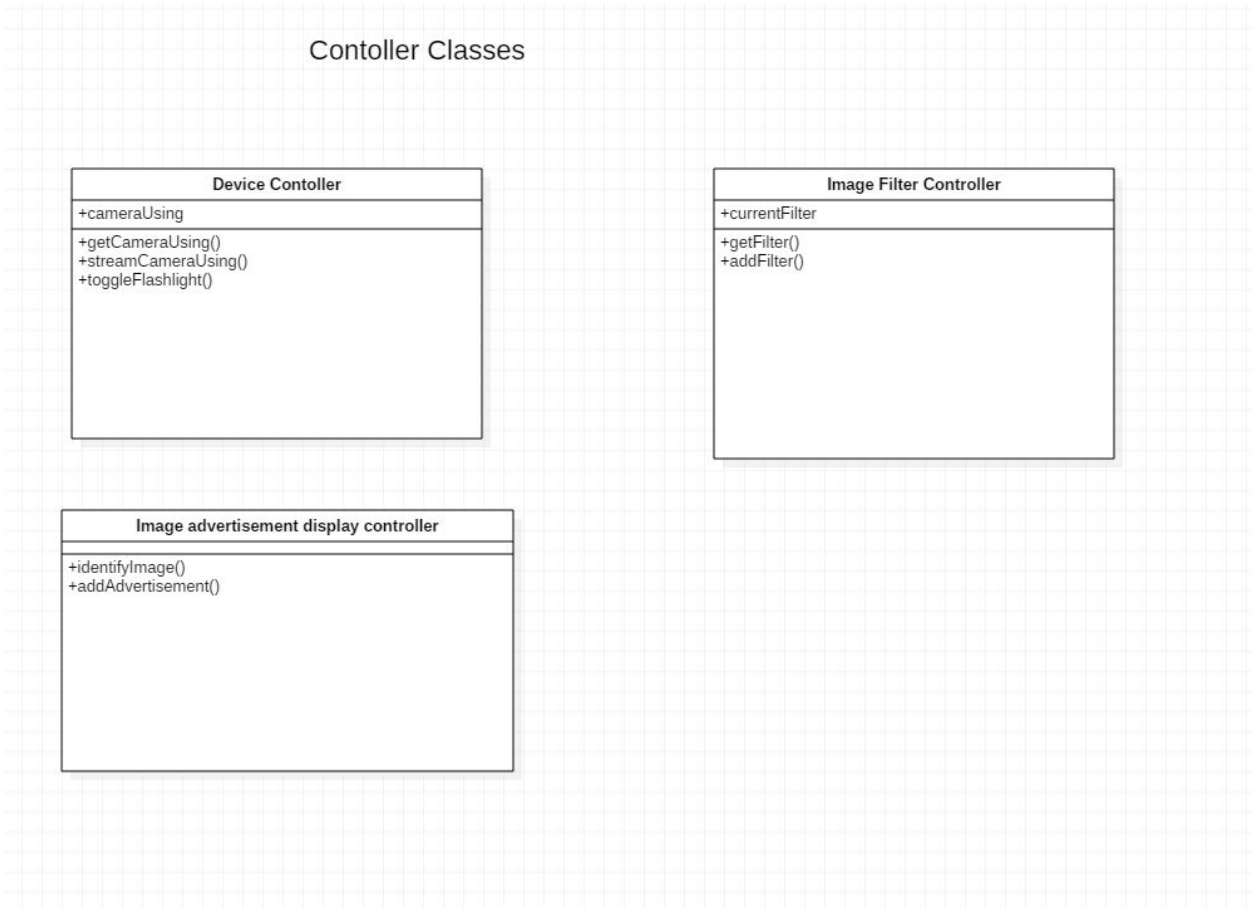
- content : This attribute contains the current ongoing camera frame

It is an *Entity Object*

**Class Name - User_Guide**

Attributes : This class just contains the help/Guide which help the user for using the App and also the Navigator mode

It is a *Entity Object*




Control classes

**Class Name - Device_Controller**

Attributes :

- cameraUsing : This attribute tells us the current camera that is being used

Method :

- getCameraUsing() : This method will start the using the Camera by collecting each and every Camera Frame
- streamCameraUsing() : This method will start streaming the Rear or front Camera Frame
- toggleFlashlight() : This method will toggle the Flashlight (i.e switch on or off the flash light)

It is a *Controller Object*

**Class Name -Image_Filter_Controller**

Attributes :

- currentFilter : This attribute contains the current filtered camera Frame that is being streamed

Method :

- getFilter() : This method will return all the filters provided by the App
- addFilter() : This method will add the filter to the Camera Frame and return the Filtered Camera Frame

It is a *Controller Object*

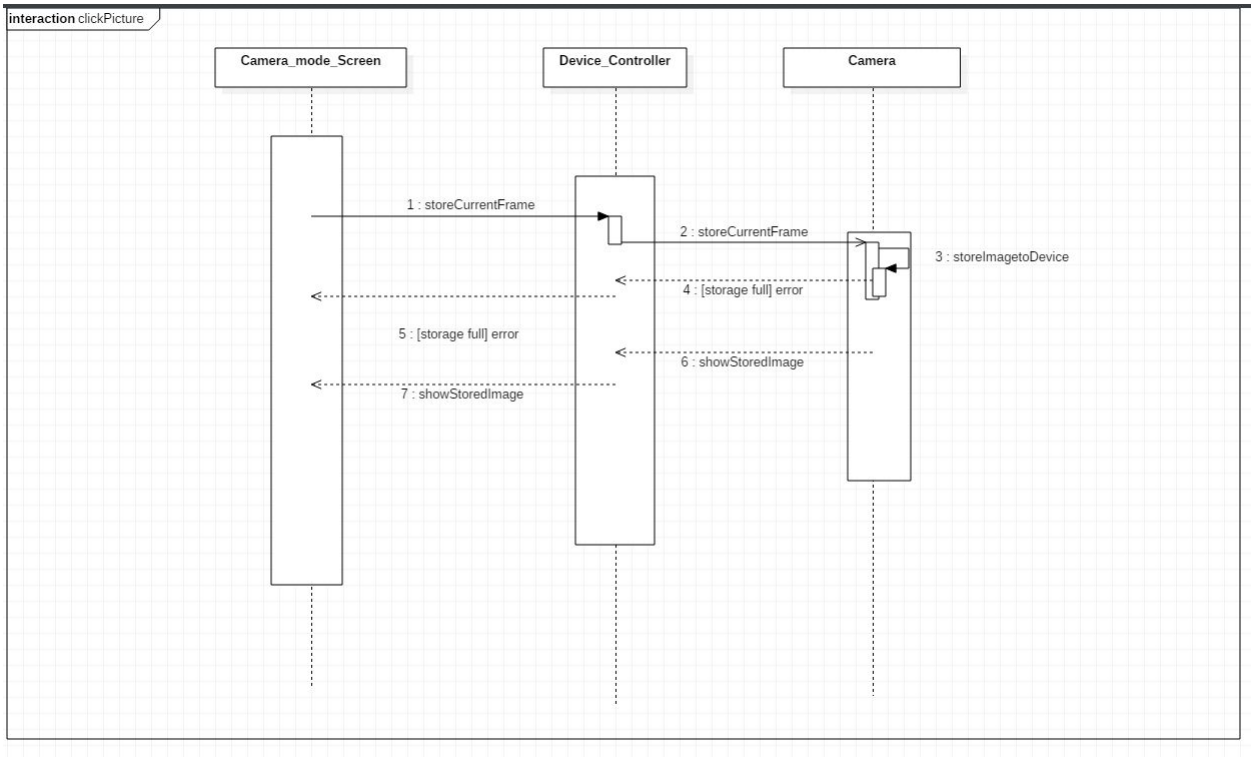
**Class Name -Image_Advertisement_Display_Controller**

Method :

- identifyImage() : This method will return the Building Name which will get matched with the Camera Frame
- addAdvertisement() : On Identifying the IITG Building, this method will return the addition of the Advertisement, Advertiser's Link to the Camera Frame, along with the Building Details

It is a *Controller Object*

## Sequence Diagram (Interaction Diagram) :-




Interaction Diagram for use case clickPicture