



Use Case Diagram & Requirement Analysis

FOR

DEEP VISION TOOL

PREPARED FOR

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PREPARED BY

SAGAR SHIVANI

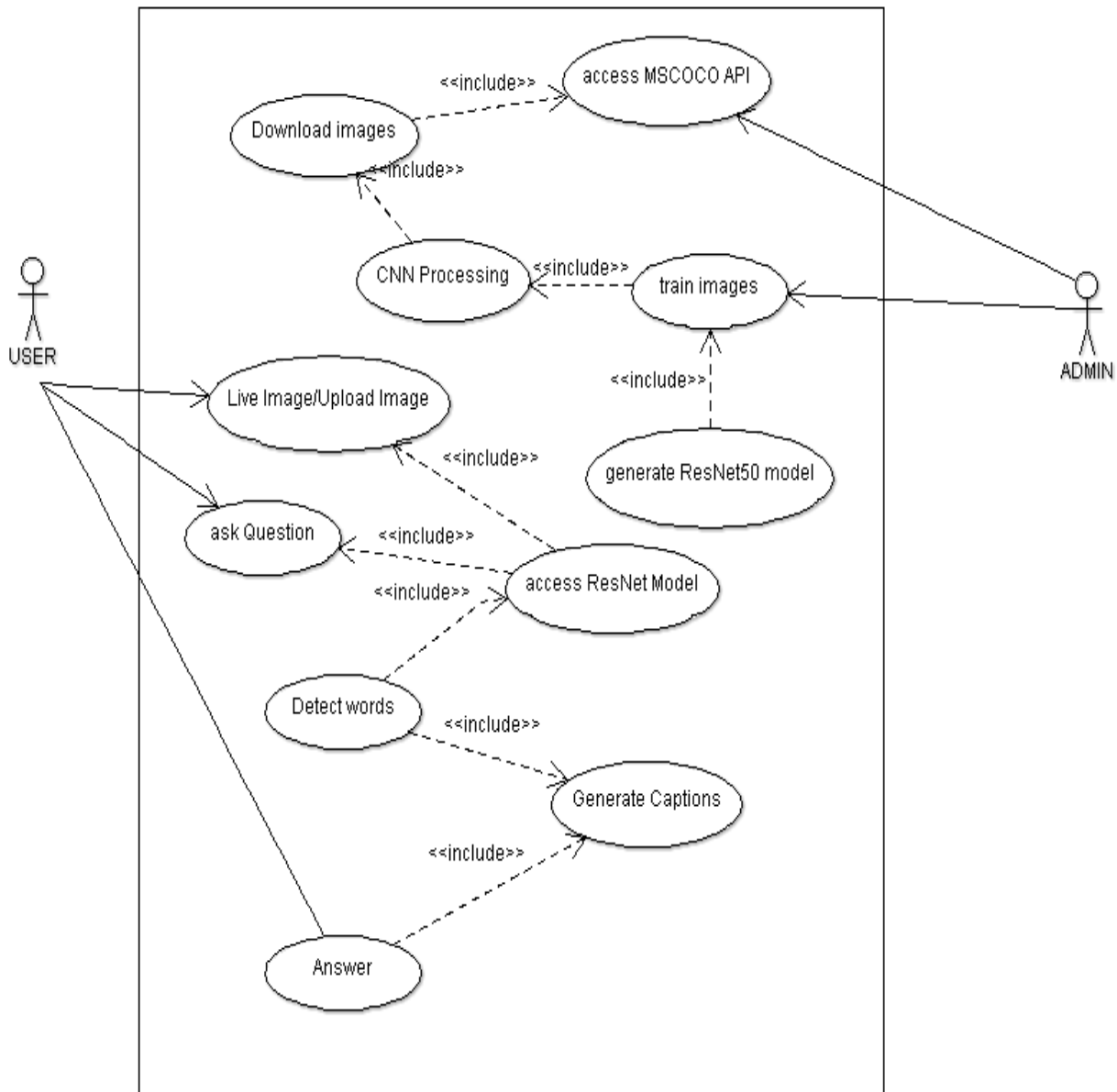
ASHISH RANA

SHAUNAK DIXIT

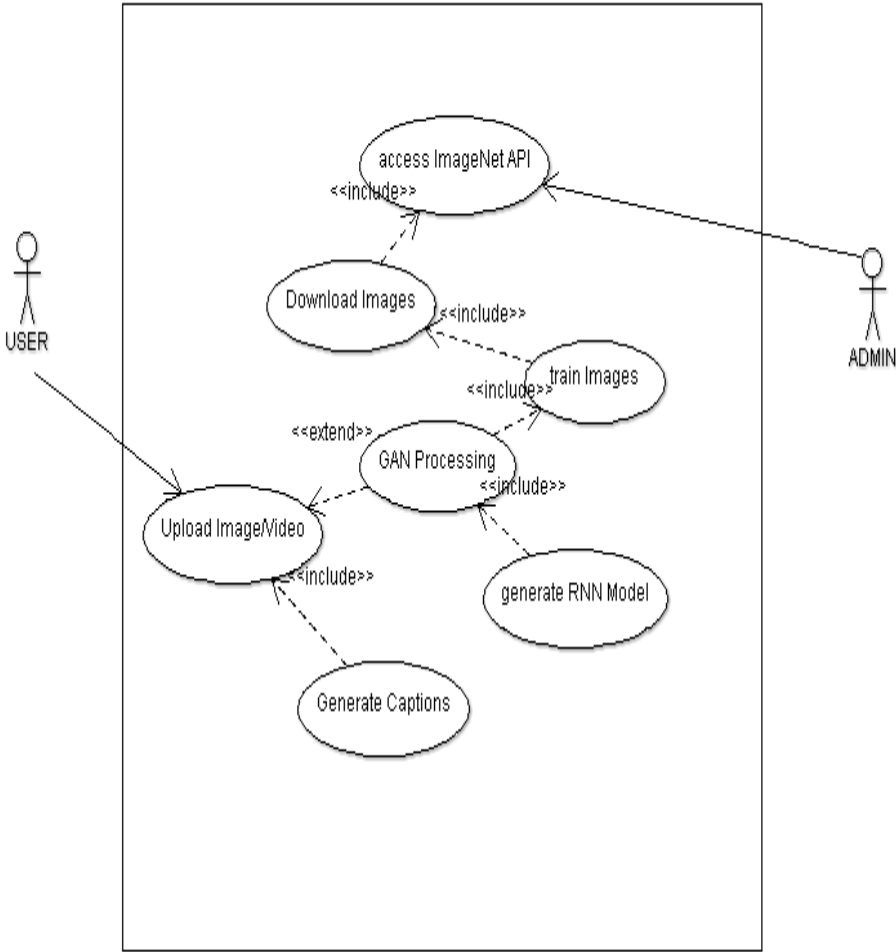
YUVRAJ VERMA

1. USE CASE DIAGRAMS

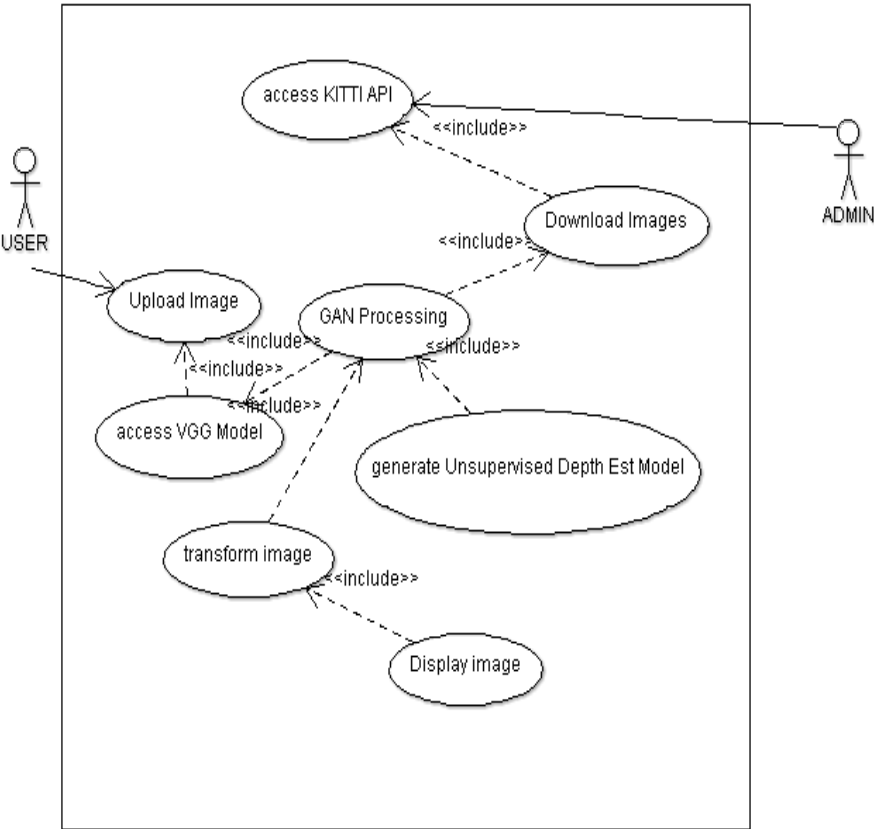
a). VQA Module



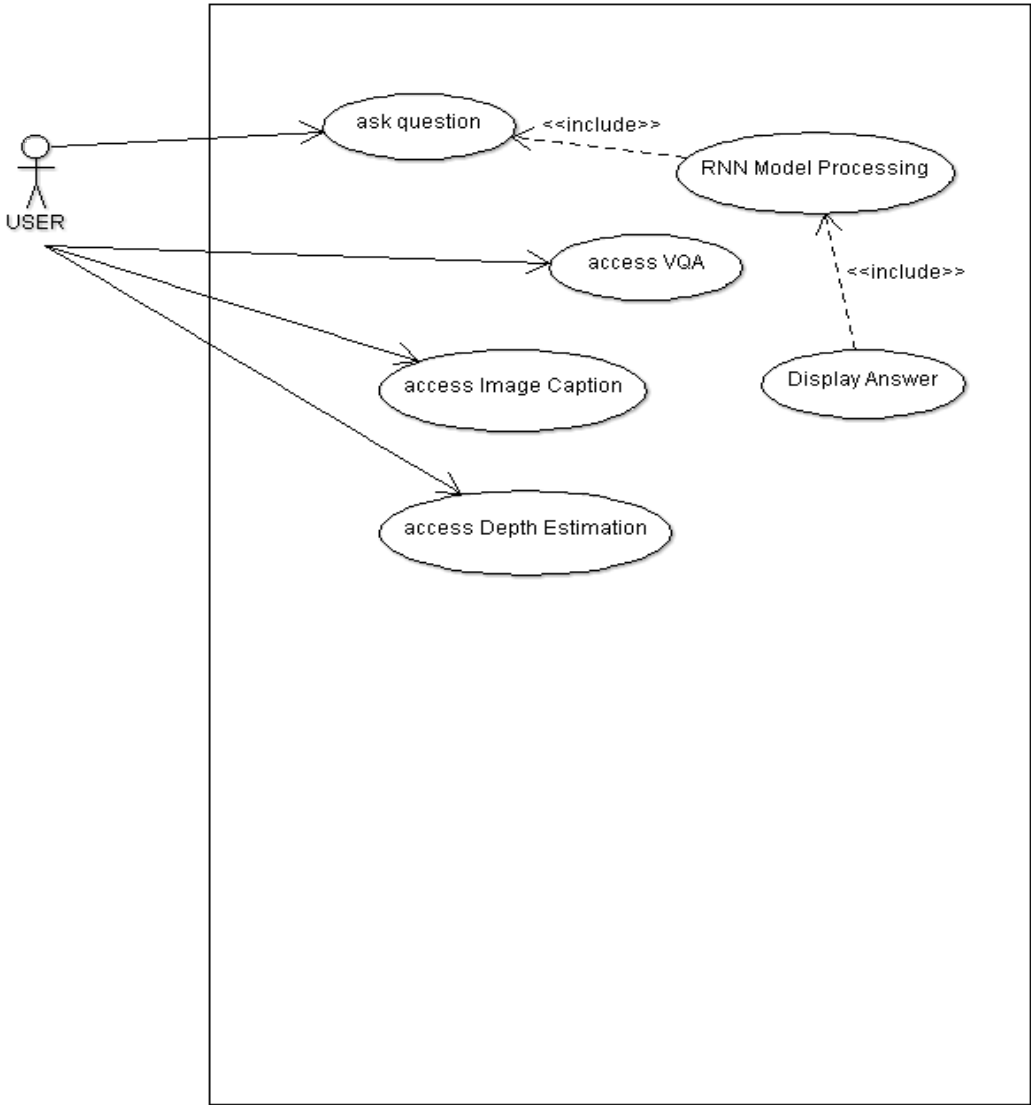
b). Image Caption Module



c) Depth Estimation Module



d) Chatbot



2. USE CASE Templates

VQA MODULE

Use Case ID:	VQ1		
Use Case Name:	Access MSCOCO API		
Created By:	Sagar Shivani	Last Updated By:	Sagar Shivani
Date Created:		Date Last Updated:	

Actor:	ADMIN
Description:	The Admin accesses MSCOCO API from the mscoco website. Mscoco Website (mscoco.org) contains annotated images and these will be used to train our model.
Preconditions:	1. User's Computer should be connected to internet. 2. User's Computer should be have sufficient memory to launch this application and save the images
Postconditions:	Connection to MSCOCO website should be established.
Priority:	It should be executed in order to download the images from the website.
Frequency of Use:	Once
Normal Course of Events:	Admin will access the Coco dataset using MSCOCO API.
Alternative Courses:	NILL
Exceptions:	NILL
Includes:	NILL
Special Requirements:	Internet Connection, Storage space on PC
Assumptions:	NILL
Notes and Issues:	NILL

Use Case ID:	VQ2		
Use Case Name:	Download Images		
Created By:	Sagar Shivani	Last Updated By:	Sagar Shivani
Date Created:		Date Last Updated:	

Actor:	ADMIN
Description:	Coco Dataset(annotated images) is downloaded as a zip folder from MSCoco website and stored on PC.

Preconditions:	User's Computer should be have sufficient memory to launch this application and save the images
Postconditions:	1.Images should not be corrupt. 2.Images should be clear.
Priority:	It should be executed in order to store the images and before any processing.
Frequency of Use:	Once
Normal Course of Events:	Admin will download the Coco dataset from http://cocodataset.org using MSCOCO API.
Alternative Courses:	NILL
Exceptions:	NILL
Includes:	NILL
Special Requirements:	Internet Connection, Storage space on PC
Assumptions:	NILL
Notes and Issues:	NILL

Use Case ID:	VQ3		
Use Case Name:	CNN Processing		
Created By:	Sagar Shivani	Last Updated By:	Sagar Shivani
Date Created:		Date Last Updated:	

Actor:	ADMIN
Description:	The downloaded images will be fed in the CNN architecture for extracting the features(captions) from the images. We will use Google cloud for CNN processing
Preconditions:	Google Cloud should be configured before any processing and should have enough credits. The instance should be running before any processing.
Postconditions:	1.All the files after processing should be accessible.
Priority:	It should be executed in order to train the images to create a model.
Frequency of Use:	2-3 times
Normal Course of Events:	Admin will start the ML engine instance in google cloud. The dataset will be processed by CNN architecture and trained to produce the proposed model.
Alternative Courses:	NILL
Exceptions:	NILL
Includes:	NILL
Special Requirements:	Internet Connection, Storage space on PC
Assumptions:	NILL
Notes and Issues:	NILL

Use Case ID:	VQ4		
Use Case Name:	train images		
Created By:	Sagar Shivani	Last Updated By:	Sagar Shivani
Date Created:		Date Last Updated:	

Actor:	ADMIN
Description:	The downloaded images will be trained by the CNN architecture
Preconditions:	Google Cloud should be configured before any processing and should have enough credits. The instance should be running before any processing.
Postconditions:	1.All the files after processing should be accessible.
Priority:	It should be executed in order to train the images to create a model.
Frequency of Use:	2-3 times
Normal Course of Events:	CNN will create a RESnet 50 model
Alternative Courses:	NILL
Exceptions:	NILL
Includes:	CNN Processing
Special Requirements:	Internet Connection, Storage space on PC
Assumptions:	NILL
Notes and Issues:	NILL

Use Case ID:	VQ5		
Use Case Name:	Generate RESNET50 model		
Created By:	Sagar Shivani	Last Updated By:	Sagar Shivani
Date Created:		Date Last Updated:	

Actor:	ADMIN
Description:	The images after being trained will produce a ResNET50 model which will be used for further processing
Preconditions:	Google Cloud should be configured before any processing and should have enough credits. The instance should be running before any processing.
Postconditions:	1.All the files after processing should be accessible.
Priority:	It should be executed in order to train the images to create a model.
Frequency of Use:	2-3 times
Normal Course of Events:	Admin will start the ML engine instance in google cloud. The dataset will be processed by CNN architecture and trained to produce the proposed model.

Alternative Courses:	NILL
Exceptions:	NILL
Includes:	CNN Processing
Special Requirements:	Internet Connection, Storage space on PC
Assumptions:	NILL
Notes and Issues:	NILL

Use Case ID:	VQ6		
Use Case Name:	Live Image/Upload Image		
Created By:	Sagar Shivani	Last Updated By:	Sagar Shivani
Date Created:		Date Last Updated:	

Actor:	USER
Description:	User will upload image using upload image button or camera will feed live image
Preconditions:	Camera should be of great quality and images should be clear.
Postconditions:	Image should be clear
Priority:	This process should be executed in order to produce commendable results
Frequency of Use:	1 times
Normal Course of Events:	CAmera will be started by the user
Alternative Courses:	NILL
Exceptions:	NILL
Includes:	NILL
Special Requirements:	High Resolution Camera
Assumptions:	NILL
Notes and Issues:	NILL

Use Case ID:	VQ7		
Use Case Name:	ask question		
Created By:	Sagar Shivani	Last Updated By:	Sagar Shivani
Date Created:		Date Last Updated:	

Actor:	User
Description:	User will ask query based questions he/she wants to know from the image.
Preconditions:	Question should be precise and pragmatic. Question should not be imperative in nature.
Postconditions:	-

Priority:	The main task of the module is to visually answer the question. So, the question asking is at the highest priority.
Frequency of Use:	Infinite
Normal Course of Events:	The user will type the question in the command prompt of the module.
Alternative Courses:	NILL
Exceptions:	NILL
Includes:	NILL
Special Requirements:	Internet Connection, Storage space on PC
Assumptions:	NILL
Notes and Issues:	NILL

Use Case ID:	VQ8		
Use Case Name:	Detect Words		
Created By:	Sagar Shivani	Last Updated By:	Sagar Shivani
Date Created:		Date Last Updated:	

Actor:	User
Description:	The module will detect the words in the questions
Preconditions:	
Postconditions:	1.All the files after processing should be accessible.
Priority:	.Detecting words is important so that captions can be generated for the question.
Frequency of Use:	1 time
Normal Course of Events:	Admin will start the ML engine instance in google cloud. The dataset will be processed by CNN architecture and trained to produce the proposed model.
Alternative Courses:	NILL
Exceptions:	NILL
Includes:	Access Resnet 50 model
Special Requirements:	-
Assumptions:	NILL
Notes and Issues:	NILL

Use Case ID:	VQ9		
Use Case Name:	Generate Captions		
Created By:	Sagar Shivani	Last Updated By:	Sagar Shivani
Date Created:		Date Last Updated:	

Actor:	User
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Description:	The architecture will generate captions from the questions and match with our ResNET50 model to create answers
Preconditions:	Model should be complete and easily accessible The Google cloud instance should run at all times
Postconditions:	The answers generated should be pragmatic
Priority:	Caption is necessary for matching the values in the model
Frequency of Use:	1 time
Normal Course of Events:	The system will generate captions from the the questions and the captions will be matched with the corresponding values to create answers
Alternative Courses:	NILL
Exceptions:	NILL
Includes:	Detect Words
Special Requirements:	-
Assumptions:	The question has keywords
Notes and Issues:	It is time consuming process

IMAGE CAPTION MODULE

Use Case ID:	IM1		
Use Case Name:	access ImageNET API		
Created By:	Sagar Shivani	Last Updated By:	Sagar Shivani
Date Created:		Date Last Updated:	

Actor:	ADMIN
Description:	The module will detect the words in the questions
Preconditions:	Internet Connection should be available
Postconditions:	Connection to ImageNet website should be established.
Priority:	It should be executed in order to download the images from the website.
Frequency of Use:	1 time
Normal Course of Events:	
Alternative Courses:	NILL
Exceptions:	NILL
Includes:	NILL
Special Requirements:	NILL
Assumptions:	NILL
Notes and Issues:	NILL

Use Case ID:	IM2		
Use Case Name:	Download Images		
Created By:	Sagar Shivani	Last Updated By:	Sagar Shivani
Date Created:		Date Last Updated:	

Actor:	User
Description:	ImageNet Dataset is downloaded as a zip folder from imagenet website and stored on PC.
Preconditions:	Internet Connection should be available
Postconditions:	Connection to ImageNet website should be established.
Priority:	It should be executed in order to download the images from the website.
Frequency of Use:	1 time
Normal Course of Events:	Admin will download the Coco dataset from http://cocodataset.org using ImageNET API.
Alternative Courses:	NILL
Exceptions:	NILL
Includes:	NILL
Special Requirements:	Internet Connection, Storage space on PC
Assumptions:	NILL
Notes and Issues:	NILL

Use Case ID:	IM3		
Use Case Name:	train images		
Created By:	Sagar Shivani	Last Updated By:	
Date Created:		Date Last Updated:	

Actor:	Admin
Description:	The downloaded images will be fed in the GAN architecture for extracting the features(captions) from the images. We will use Google cloud for GAN processing
Preconditions:	1. Google Cloud should be configured before any processing and should have enough credits. 2. The instance should be running before any processing.
Postconditions:	1.All the files after processing should be accessible.
Priority:	It should be executed in order to train the images to create a model
Frequency of Use:	Once

Normal Course of Events:	GAN will create RNN model
Alternative Courses:	Nill
Exceptions:	NILL
Includes:	Download Images
Special Requirements:	Internet Connection, Storage space on PC
Assumptions:	NILL
Notes and Issues:	NILL

Use Case ID:	IM4		
Use Case Name:	GAN Processing		
Created By:	Sagar Shivani	Last Updated By:	
Date Created:		Date Last Updated:	

Actor:	User
Description:	The downloaded images will be fed in the GAN architecture for extracting the features(captions) from the images. We will use Google cloud for GAN processing
Preconditions:	Google Cloud should be configured before any processing and should have enough credits. The instance should be running before any processing.
Postconditions:	All the files after processing should be accessible.
Priority:	It should be executed in order to train the images to create a model
Frequency of Use:	2-3 times
Normal Course of Events:	Admin will start the ML engine instance in google cloud. The dataset will be processed by GAN architecture and trained to produce the proposed model.
Alternative Courses:	Nill
Exceptions:	Nill
Includes:	train images
Special Requirements:	Nill
Assumptions:	Nill
Notes and Issues:	Nill

Use Case ID:	IM5		
Use Case Name:	Upload Image/Video		
Created By:	Sagar Shivani	Last Updated By:	
Date Created:		Date Last Updated:	

Actor:	User
Description:	User will upload image using upload image button or video
Preconditions:	Camera should be of great quality and images should be clear.
Postconditions:	Image should be clear
Priority:	This process should be executed in order to produce commendable results
Frequency of Use:	1 time
Normal Course of Events:	Camera will be started by the user
Alternative Courses:	Nil
Exceptions:	Nil
Includes:	GAN Processing
Special Requirements:	High Resolution Camera
Assumptions:	Nil
Notes and Issues:	Nil

Use Case ID:	IM6		
Use Case Name:	Generate Captions		
Created By:	Sagar	Last Updated By:	
Date Created:		Date Last Updated:	

Actor:	User
Description:	The uploaded image will be processed by the GANs and the captions in the image will be predicted using the model
Preconditions:	Model should be complete and easily accessible The Google cloud instance should run at all times The instance should be running before any processing.
Postconditions:	The answers generated should be pragmatic
Priority:	Main function of the module
Frequency of Use:	User Defined
Normal Course of Events:	The system will generate captions from the image

Alternative Courses:	Nill
Exceptions:	Nill
Includes:	upload image/video
Special Requirements:	nill
Assumptions:	nill
Notes and Issues:	nill

CHATBOT MODULE

Use Case ID:	CH1		
Use Case Name:	ask question		
Created By:	Sagar Shivani	Last Updated By:	
Date Created:		Date Last Updated:	

Actor:	User
Description:	The user will access the question he wants to know
Preconditions:	Question should be precise and pragmatic. Question should not be imperative in nature.
Postconditions:	Sequence to Sequence Model should be complete accessible
Priority:	Purpose of chatbot
Frequency of Use:	User defined
Normal Course of Events:	The user will type the question
Alternative Courses:	-
Exceptions:	-
Includes:	-
Special Requirements:	PC with good processing
Assumptions:	-
Notes and Issues:	-

Use Case ID:	CH2		
Use Case Name:	access VQA		
Created By:	Sagar	Last Updated By:	
Date Created:		Date Last Updated:	

Actor:	User
Description:	This function will open the VQA module.Further functions are in the VQA diagram.
Preconditions:	-
Postconditions:	-
Priority:	-
Frequency of Use:	User-defined
Normal Course of Events:	User will type the command to access the module
Alternative Courses:	-
Exceptions:	-
Includes:	-
Special Requirements:	Storage space
Assumptions:	-
Notes and Issues:	-

Use Case ID:	CH3		
Use Case Name:	access Image Caption		
Created By:	Sagar	Last Updated By:	
Date Created:		Date Last Updated:	

Actor:	User
Description:	This function will open the Image Caption module.Further functions are in the Image Caption diagram.
Preconditions:	-
Postconditions:	-
Priority:	-
Frequency of Use:	User defined
Normal Course of Events:	User will type the command to access the module
Alternative Courses:	-
Exceptions:	-
Includes:	-
Special Requirements:	-
Assumptions:	--
Notes and Issues:	-

Use Case ID:	CH4		
Use Case Name:	access Depth Estimation		
Created By:	Sagar	Last Updated By:	Sagar
Date Created:		Date Last Updated:	

Actor:	User
Description:	This function will open the Depth Estimation module.Further functions are in the VQA diagram.
Preconditions:	-
Postconditions:	-
Priority:	-
Frequency of Use:	User defined
Normal Course of Events:	User will type the command to access the module
Alternative Courses:	-
Exceptions:	-
Includes:	-
Special Requirements:	-
Assumptions:	--
Notes and Issues:	-

DEPTH ESTIMATION MODULE

Use Case ID:	DP1		
Use Case Name:	access KITTI API		
Created By:		Last Updated By:	
Date Created:		Date Last Updated:	

Actor:	ADMIN
Description:	The Admin accesses KITTI API from the toyota/stanford website. KITTI dataset contains unsupervised trained images to produce a mapping of depth of imager.
Preconditions:	1. User's Computer should be connected to internet. 2. User's Computer should be have sufficient memory to launch this application and save the images
Postconditions:	Connection to stanford website should be established.

Priority:	It should be executed in order to download the images from the website.
Frequency of Use:	Once
Normal Course of Events:	Admin will access the KITTI dataset using KITTI API.
Alternative Courses:	-
Exceptions:	-
Includes:	-
Special Requirements:	Internet Connection, Storage space on PC
Assumptions:	-
Notes and Issues:	-

Use Case ID:	DP2		
Use Case Name:	Download Images		
Created By:	Sagar	Last Updated By:	
Date Created:		Date Last Updated:	

Actor:	ADMIN
Description:	KITTI Dataset(annotated images) is downloaded as a zip folder from stanford website and stored on PC.
Preconditions:	User's Computer should be have sufficient memory to launch this application and save the images
Postconditions:	1.Images should not be corrupt. 2.Images should be clear.
Priority:	It should be executed in order to store the images and before any processing.
Frequency of Use:	Once
Normal Course of Events:	Admin will download the KITTI dataset from stanford website using KITTI API.
Alternative Courses:	-
Exceptions:	-
Includes:	access KITTI API
Special Requirements:	Internet Connection, Storage space on PC
Assumptions:	NILL
Notes and Issues:	NILL

Use Case ID:	DP3		
Use Case Name:	GAN Processing		
Created By:		Last Updated By:	
Date Created:		Date Last Updated:	

Actor:	Admin
Description:	The downloaded images will be fed in the GAN architecture for extracting the features(captions) from the images. We will use Google cloud for GAN processing
Preconditions:	Google Cloud should be configured before any processing and should have enough credits. The instance should be running before any processing
Postconditions:	1.All the files after processing should be accessible.
Priority:	It should be executed in order to train the images to create a mode
Frequency of Use:	2-3 times
Normal Course of Events:	Admin will start the ML engine instance in google cloud. The dataset will be processed by GAN architecture and trained to produce the proposed model.
Alternative Courses:	-
Exceptions:	-
Includes:	Download Images
Special Requirements:	-
Assumptions:	-
Notes and Issues:	-

Use Case ID:	DP4		
Use Case Name:	generate Unsupervised Depth Estimation Model		
Created By:	Sagar Shivani	Last Updated By:	
Date Created:		Date Last Updated:	

Actor:	Admin
Description:	The images after being trained will produce a Unsupervised Depth Estimation model which will be used for further processing

Preconditions:	Google Cloud should be configured before any processing and should have enough credits. The instance should be running before any processing.
Postconditions:	1.All the files after processing should be accessible.
Priority:	It should be executed in order to train the images to create a model.
Frequency of Use:	2-3 times
Normal Course of Events:	Admin will start the ML engine instance in google cloud. The dataset will be processed by GAN architecture and trained to produce the proposed model.
Alternative Courses:	-
Exceptions:	-
Includes:	GAN Processing
Special Requirements:	Internet Connection, Storage space on PC
Assumptions:	-
Notes and Issues:	-

Use Case ID:	DP5		
Use Case Name:	upload Image		
Created By:	Sagar	Last Updated By:	
Date Created:		Date Last Updated:	

Actor:	User
Description:	User will upload image using upload image button or camera will feed live image
Preconditions:	Camera should be of great quality and images should be clear.
Postconditions:	Image should be clear
Priority:	This process should be executed in order to produce commendable results
Frequency of Use:	1 time
Normal Course of Events:	Camera will be started by the user
Alternative Courses:	-
Exceptions:	-
Includes:	GAN Processing
Special Requirements:	CAMERA
Assumptions:	-
Notes and Issues:	-

Use Case ID:	DP6		
Use Case Name:	access VGG Model		
Created By:	Sagar Shivani	Last Updated By:	
Date Created:		Date Last Updated:	

Actor:	User
Description:	The architecture will transform image into a heat map type image to predict the depth of objects in the image
Preconditions:	Model should be complete and easily accessible The Google cloud instance should run at all times
Postconditions:	The answers generated should be clear
Priority:	It is necessary for creating the new image
Frequency of Use:	1 time
Normal Course of Events:	The uploaded image will undergo processing to produce a depth estimated image
Alternative Courses:	-
Exceptions:	-
Includes:	-
Special Requirements:	-
Assumptions:	-
Notes and Issues:	-

Use Case ID:	DP7		
Use Case Name:	transform image		
Created By:	Sagar Shivani	Last Updated By:	
Date Created:		Date Last Updated:	

Actor:	User
Description:	The image is transformed using unsupervised algorithms to produce a depth estimated map.
Preconditions:	Model should be complete.
Postconditions:	Image should be clear
Priority:	This is necessary to create images
Frequency of Use:	1 time

Normal Course of Events:	The architecture will transform the image
Alternative Courses:	-
Exceptions:	-
Includes:	Gan Processing,access VGG model
Special Requirements:	Internet Connection
Assumptions:	-
Notes and Issues:	-

Use Case ID:	DP8		
Use Case Name:	Display Image		
Created By:	Sagar Shivani	Last Updated By:	
Date Created:		Date Last Updated:	

Actor:	User
Description:	display the image
Preconditions:	image should be transformed
Postconditions:	-
Priority:	-
Frequency of Use:	1
Normal Course of Events:	The image will be displayed on monitor.
Alternative Courses:	-
Exceptions:	-
Includes:	transform image
Special Requirements:	-
Assumptions:	-
Notes and Issues:	-

3. List of Tasks and subtasks for completion of modules and combination of them into one module.

* Studying deep-learning and tensorflow libraries. Plus, learning about current existing implementations for better improvements.

- I. Deep learning, tensorflow and pytorch learn and practice.
- II. Current existing projects analyze like Detectron.
- III. Deciding and designing improvements on these projects.

* Downloading datasets and training with deep-learning models.

- I. Downloading datasets specific to each module like MS-COCO for VQA, FLICKR for context analysis, RGBD for depth analysis and a combination of datasets for demonstrative NLP chatbot.
- II. Training respective models for all modules CNN, RNN+LSTM, CNN, Seq to Seq model same specified order as written above for modules.

* Creating GUIs for all modules and main software plus integrating them. Allowing independent functioning and integrated functioning.

- I. Incorporating models trained with GUI designed for each module providing independent functionality.
- II. Integrated all modules to make the complete software. A chatbot classifier of questions asked to handle which module will be used to answer the respective question.

* Verification and validation of the developed software.

- I. Standard testing approaches will be applied to check the functionality of the software like unit testing, integration testing, refactor testing.
- II. Validation with approaches like customer acceptance test and beta testing will be done.

* Open source deployment and maintenance.

- I. Deploying the software open source on github platform. New issues raised will help in maintaining the software.
- II. Creating and maintaining the software's dedicated site.
- III. Continuous Integration tests created open source deployed software.
- IV. New version releases with closed raised issues and incorporating future extensions for keeping software updated.

6. Requirements Of The Project

Use Case1 : VQA Answering

Functional Requirements:-

- User upload images for visual question answer. No size specification as such required.
- The model will be trained on huge dataset of MS-COCO for creating final vector deciding outputs.
- User can ask question in objective sense in this tool but not context oriented sense.
- ResNet Model detect words from queries asked by user.
- Training of image is being done using simple CNN processing mechanism.
- For achieving maximum accuracy with different stacking permutations of layers and number of layers will be decided with trial and error approach.

Non- Functional Requirements: -

- Accessibility : Easily accessible with both command line and GUI options available. Source code will also be available online.
- Efficiency : CNN model is highly efficient to perform image information vector related tasks.
- Effectiveness : High quality of image with proper dataset having huge number of images with proper questions associated with them makes the system efficient.
- Fault tolerance : If any of the image is blur then we will apply filters and digital image processing principles for making image clear.
- Maintainability : With open-source deployment and monthly releases this software will be maintained.
- Usability : This tool is having educational uses, information retrieval uses and information extraction uses with simple usage approach. The system

will be easy to handle and navigates in the most expected way with minimal design and no delays.

Use Case2 : Image Caption Generator

Functional Requirements:-

- User will upload images to access image caption. No size specification as such required.
- The models will be trained on FLICKR dataset which will help create encoding and decoding vectors for queried questions.
- RNN model will process on image and then create an encoded word vector.
- Objects within the image will be identified by RNN model. Also, current existing Detector API will be used for achieving higher accuracy.
- Caption are generated as answer by RNN model in the form of decoded answer vector as a reply.

Non- Functional Requirements: -

- Accessibility : Easily accessible with both command line and GUI options available. Source code will also be available online.
- Efficiency: RNN model is highly efficient for detecting object. Along with Detectron API a much more cohesive detection of object will take place.
- Effectiveness: High quality of image with proper dataset having caption related information encoded into it make system efficient.
- Fault tolerance: If any of the image is blur then we will apply filters and digital image processing principles for making image clear.
- Maintainability: With open-source deployment and monthly releases this software will be maintained.
- Usability: This tool will be used for activity classification, object relations and many more information extraction purposes. Also, basic caption generator will help to describe the image and its components.

Use Case3 : DepthAnalysisTool

Functional Requirements:-

- User will upload image for depth analysis. No size specification as such required.
- The models will be trained on RGBD dataset which is having depth information encoded into it.
- VGG model will access the uploaded image and will convert it into input form for GAN processing step.
- GAN processing will generate the dept estimation model for that particular image for answering the queries by user.
- CNN processing will also take for this purpose for better performance and accuracy.

Non- Functional Requirements: -

- Accessibility : Easily accessible with both command line and GUI options available. Source code will also be available online.
- Efficiency: VGG model is highly efficient for detecting object and creating encoded vectors.
- Effectiveness: Sharper image with proper dataset make system efficient like in RGBD dataset.
- Reliability : GAN and CNN in combination will give higher accuracy i.e. more number of correct answers with number of queries asked. Hence, making the system reliable.
- Maintainability : With open-source deployment and monthly releases this software will be maintained.
- Usability : The mechanism of this system can be used by people with vision impairment, defence and geolocation purposes. Also, delays in this software are also minimum.

Use Case 4: NLP Chatbot

Functional Requirements: -

- Demonstrative chatbot with combination of dataset like Cornell Movie dataset, Reddit dataset, Quora dataset for training will be used.
- Sequence to Sequence model will be used for chatbot development.
- User will be able to ask generic conversational questions and proper replying capabilities will be encoded into it.
- Chatbot will act as underlying mechanism for caption generator tool as both uses similar models.

Non- Functional Requirements: -

- Accessibility : Easily accessible with both command line and GUI options available.
- Efficiency : Sequence to Sequence model is highly efficient for chatbot training and creating proper replying mechanism.
- Reliability : Grammatically correct sentences with proper context will make system reliable.
- Maintainability: With open-source deployment and monthly releases this software will be maintained.
- Usability: The system will be easy to handle and navigates in the most expected way with minimal design and no delays.

Use Case Main Module : DeepVisionTool

Functional Requirements:-

- User upload images for queries to be answered. No size specification as such required.
- This tool is integration of all modules. NLP Chatbot will classify the queries asked to be sent to which module for processing.
- Each query will be answered by single module only and response is independent of other modules.
- User can ask question either in objective, context or depth related sense and will receive a suitable reply.
- Tkinter library will be used for making GUI for this tool.

Non- Functional Requirements: -

- Accessibility : Easily accessible with both command line and GUI options available. Source code will also be available online.
- Efficiency : As single module is used for answering each query respectively the efficiency will be higher.
- Effectiveness : Single module to query mechanism will accurate and reliable answers with only module in place it will give higher efficiency.
- Fault tolerance : If any of the image is blur then we will apply filters and digital image processing principles for making image clear.
- Maintainability : With open-source deployment and monthly releases this software will be maintained. Also, a live website for this tool will also be hosted.
- Usability : This tool is having educational uses, information retrieval uses, defence, geolocation and information extraction uses with simple usage approach. The system will be easy to handle and navigates in the most expected way with minimal design and no delays.