Guide Me

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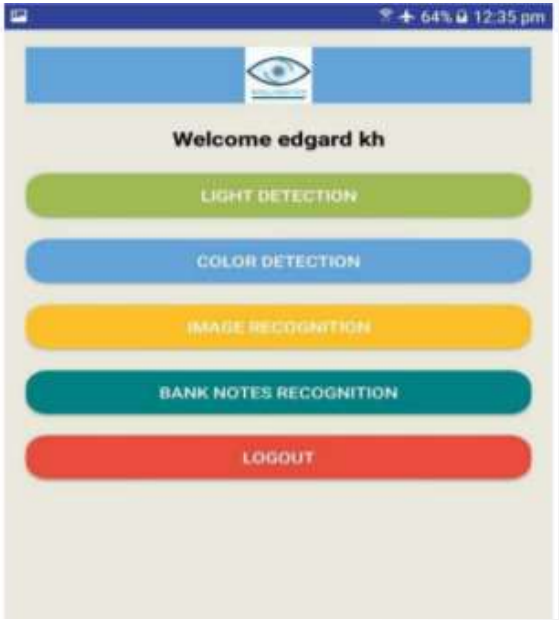
Objective

By using **Guide-Me**, users with any type of impairment could now navigate freely and safely even in new places which is the most tackled issue by anyone with vision impairment as well as find their own objects which is something provided in our system using find my object module.

Similar System

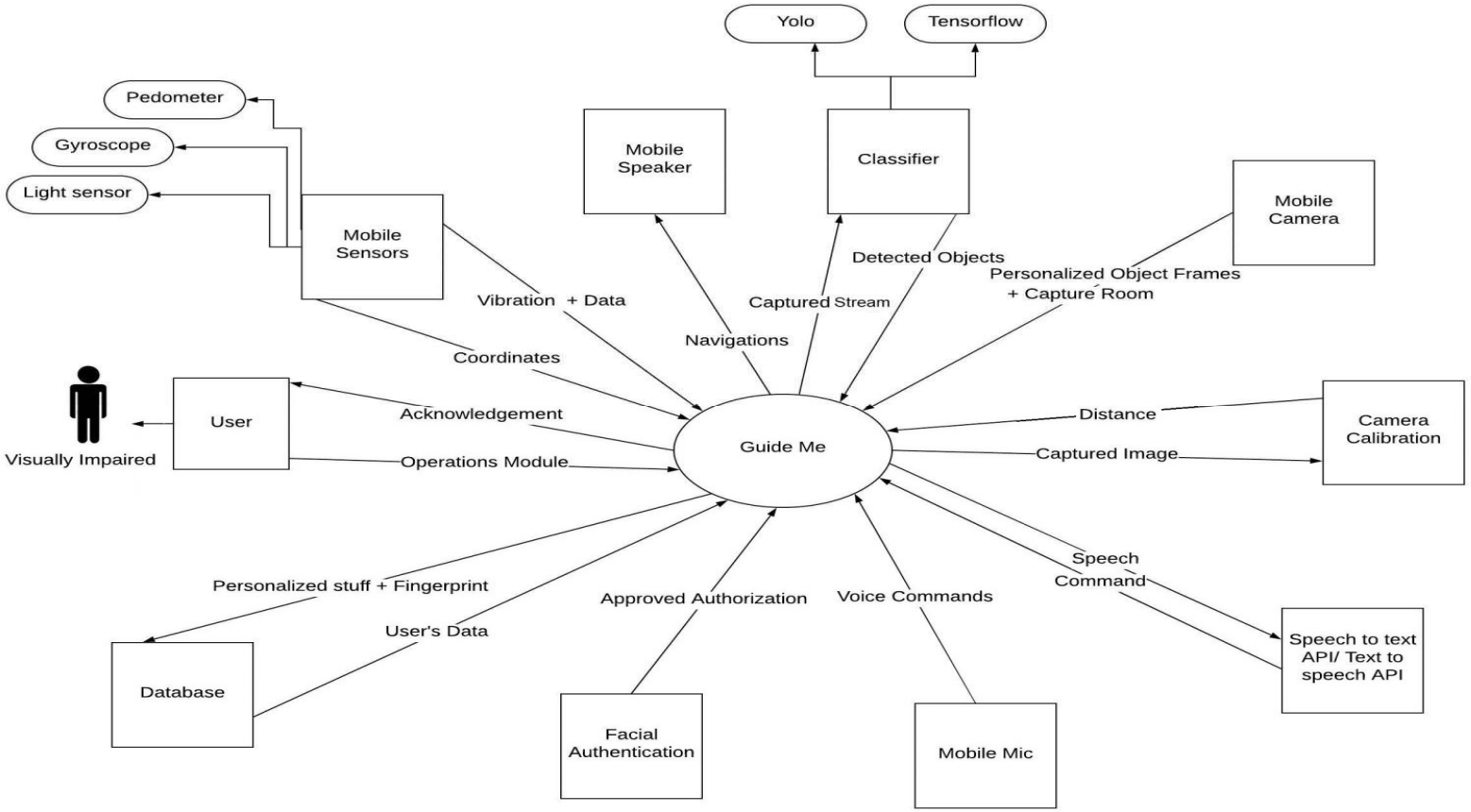
- Intelligent Eye: A Mobile Application for Assisting Blind People through four functions



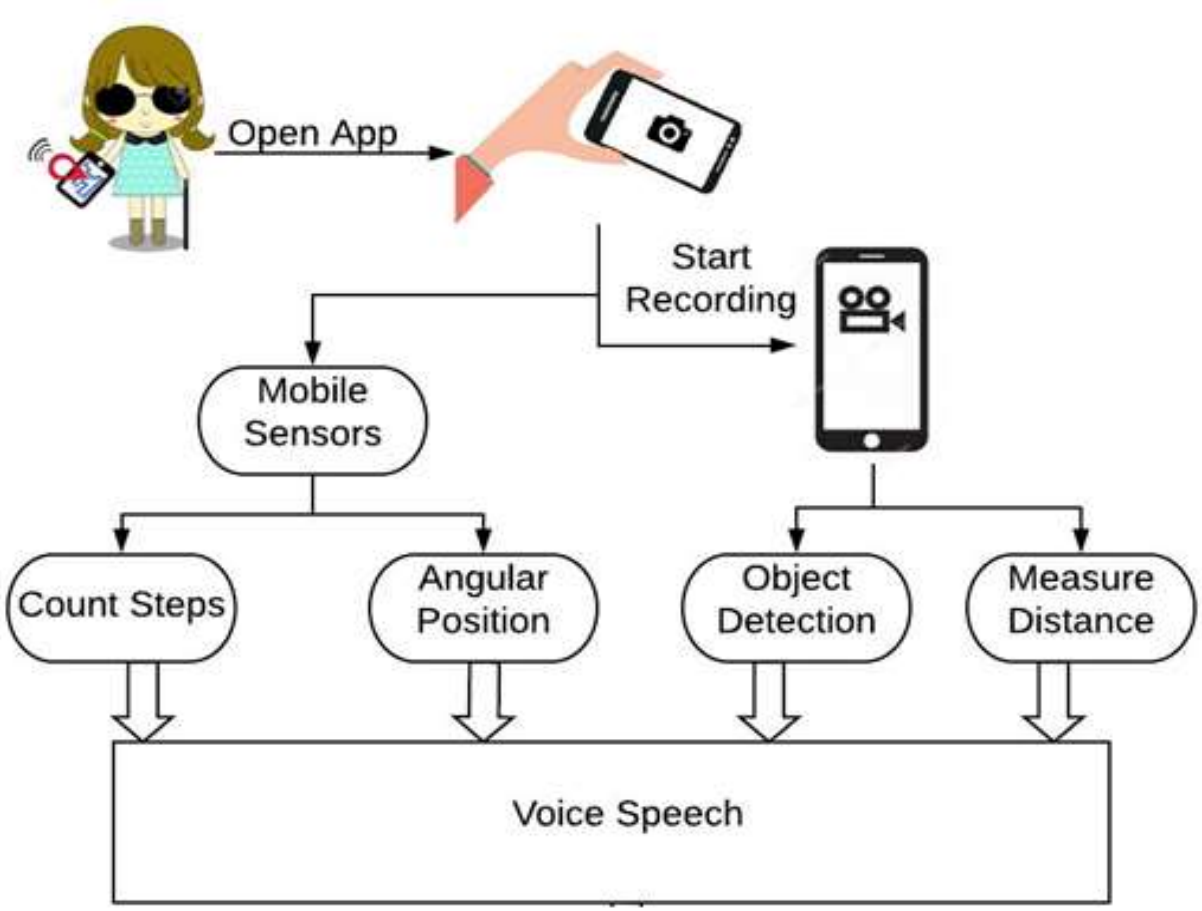
- All of the previously mentioned functions are implemented to facilitate lives of visually impaired people and achieved using only mobile phone which is the same concept we are going to use in our system.

[1] Milios Awad, Tarek Mahmoud, “Intelligent eye: A mobile application for assisting blind people,”2018 9th IEEE Annual Ubiquitous Computing, Electronics Mobile Communication Conference(UEMCON), p. 6, 2018

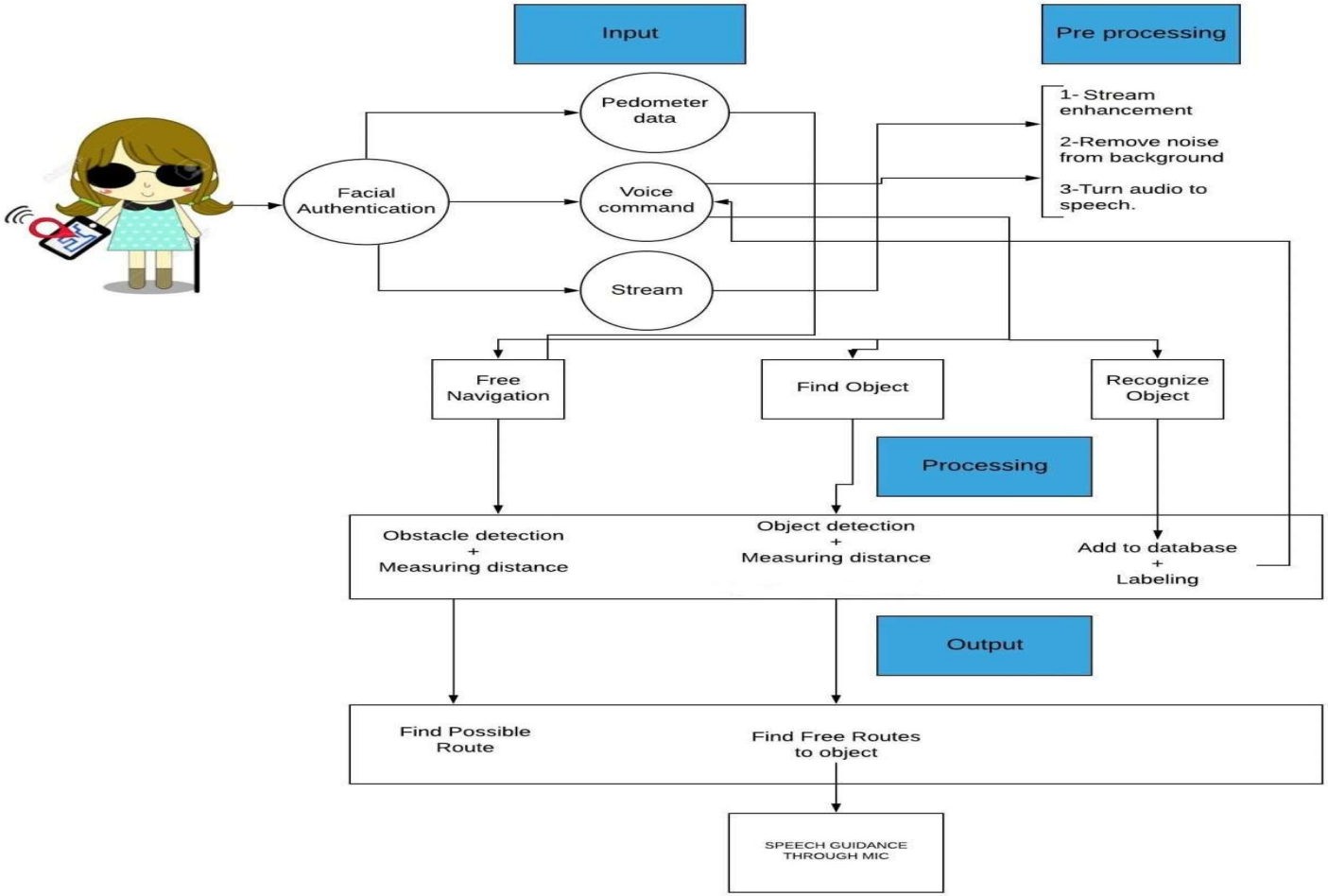
Context Diagram



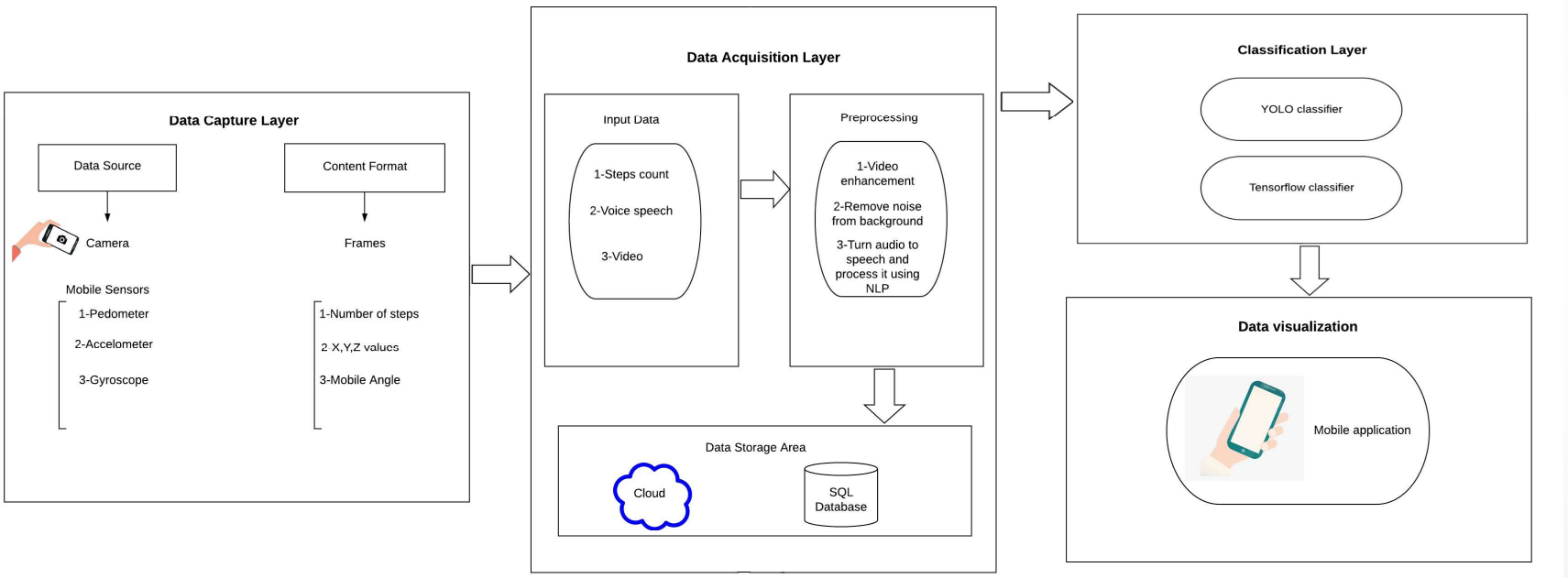
Business Context



System Overview



Block Diagram



Most Important Functional Requirement
1- Facial Recognition

Title	Facial Recognition
Description	This model uses Artificial Intelligence techniques in order to identify the user existing in the frame
Input	Image containing user's face
Source	Smartphone frontal camera
Output	User info if the user exists in the database
Action	Check video input for at least one face, encode the facial features and compare them to existing ones in the database
Pre-condition	The user has an account with facial images available in the database
Post-condition	If the user is valid, he is allowed to access the application and his own customized objects.
Dependencies	F1,F2,F3

Most Important Functional Requirement 2- Object Detection

Title	Object Detection
Description	Detect and track objects in the video
Input	Video Stream
Source	Smartphone frontal camera
Output	Labels detected and coordinates
Action	Check Stream for objects and recognize them and track their x,y coordinates
Pre-condition	Video stream contains objects
Post-condition	Coordinates are used to keep track of where an object resides and sent to the navigation model
Dependencies	F1,F2,F5

Most Important Functional Requirement
3- Voice Menu

Title	Navigation
Description	The system presents menu options using speech.
Input	None
Source	Smartphone’s mic.
Output	Audio
Action	Convert text to audible speech.
Pre-condition	The user is logged in.
Post-condition	The system awaits audio commands from the user.
Dependencies	F1,F2

Most Important Functional Requirement
4- Voice commands

Title	Create Bounding Box
Description	The system interacts with the user's verbal commands.
Input	Audio
Source	Smartphone mic.
Output	Text
Action	Check audio for speech, look for desired item in the options available.
Pre-condition	The system has presented the voice menu.
Post-condition	The system executes the option the user has selected.
Dependencies	F1,F2,F7,F8

Most Important Functional Requirement
5- Navigation

Title	Navigation
Description	The system finds the route for the desired item
Input	Voice input
Source	Smartphone’s mic.
Output	Audio
Action	Guide the user to his desired object by allocating and tracking it in the stream
Pre-condition	The object is found in the stream.
Post-condition	The object is tracked in the stream.
Dependencies	F1,F2,F5,F12

Non Functional Requirements

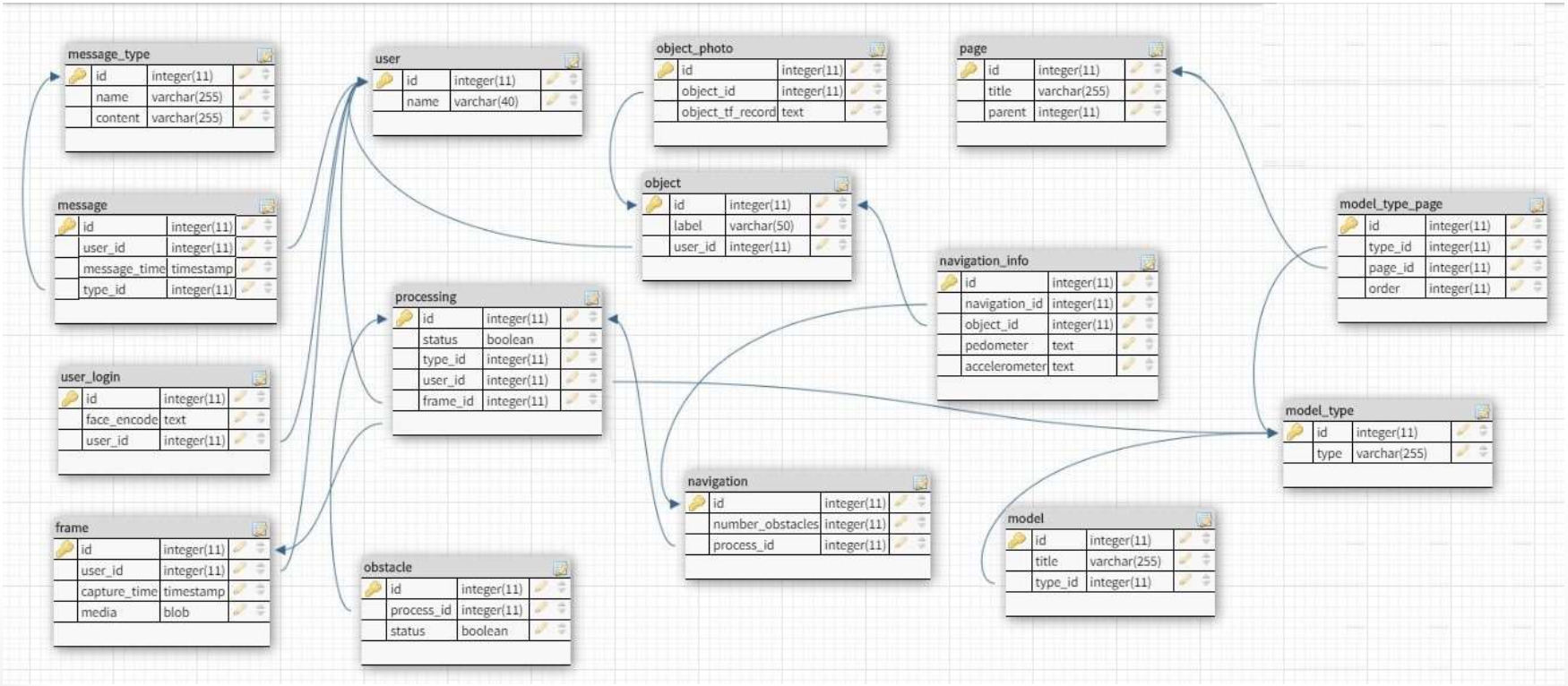
- **Performance and Speed**

- **Reliability**

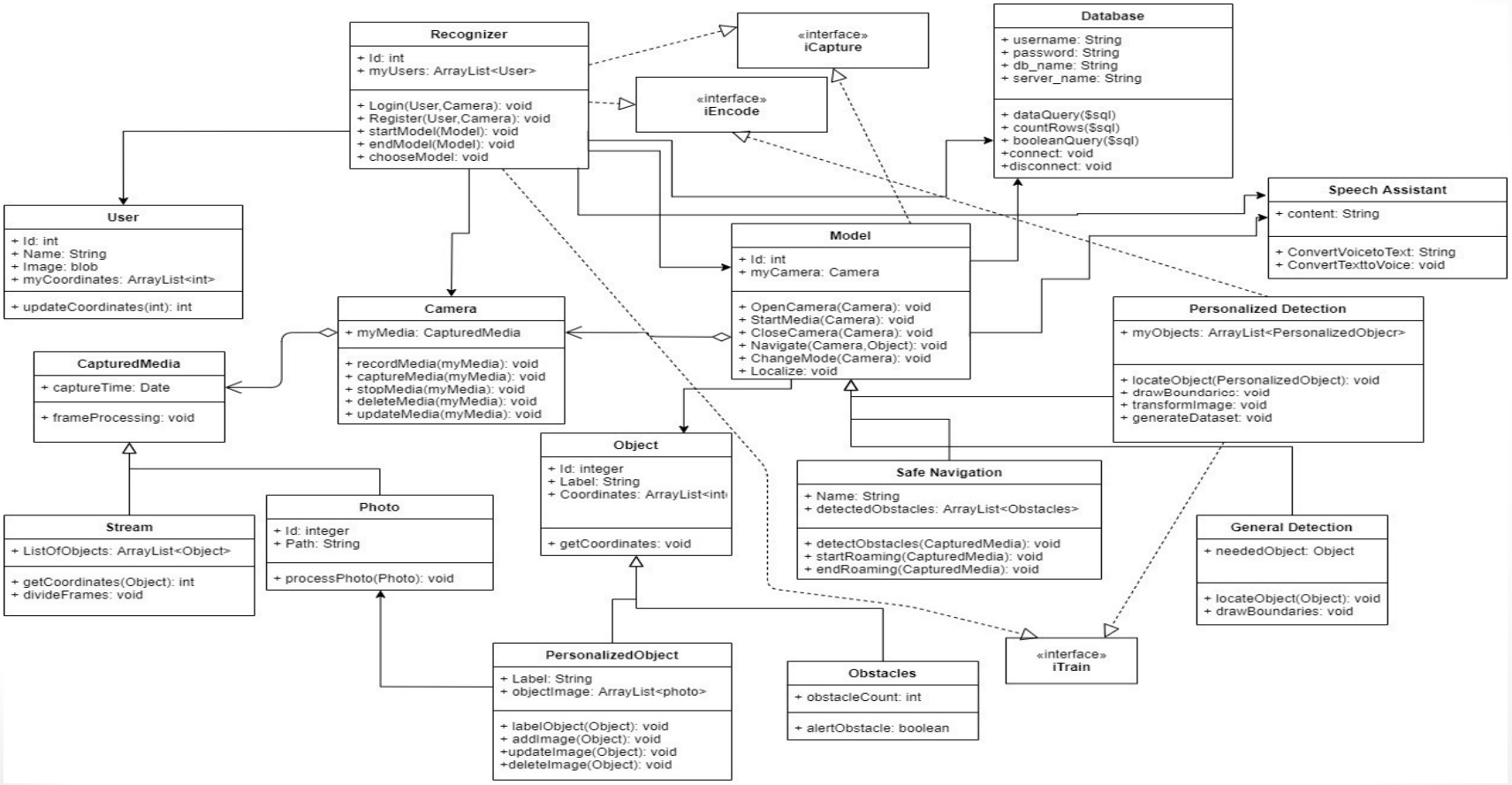
- **Usability**

- **Scalability**

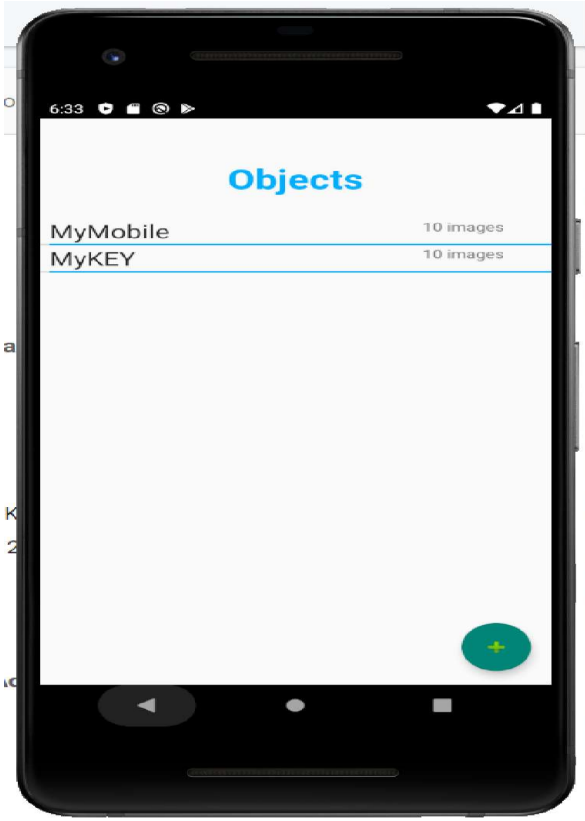
Database Diagram



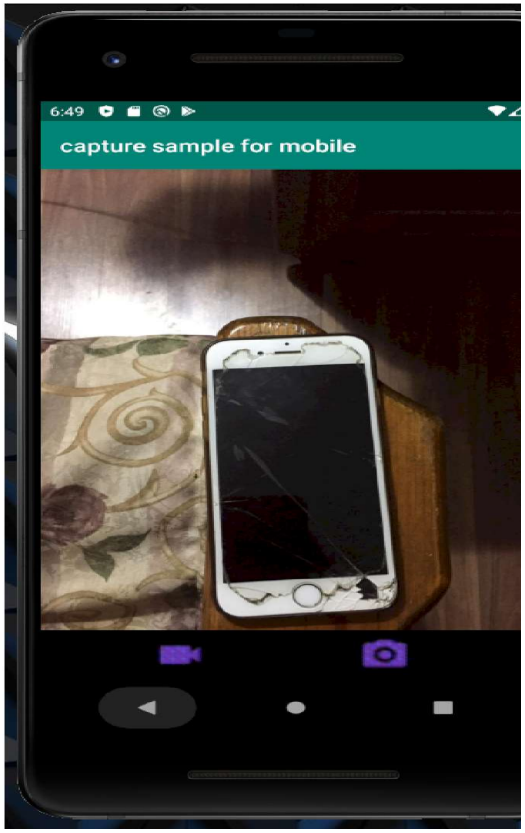
Class Diagram



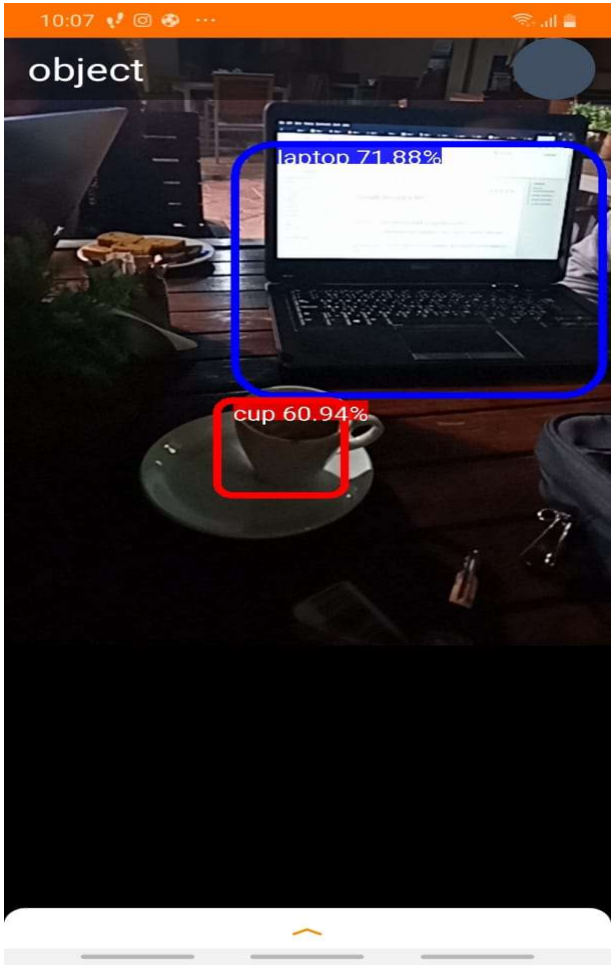
Adding new object



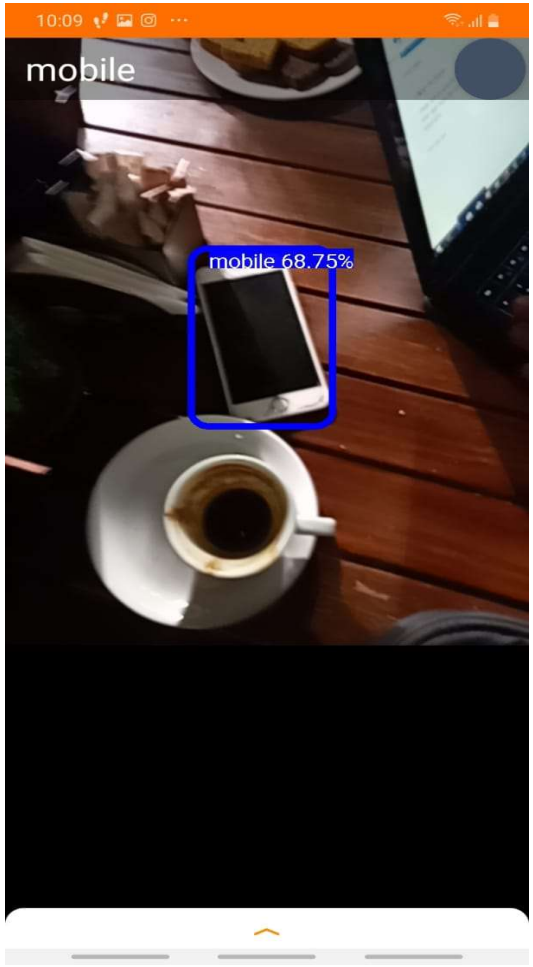
Capturing new object



General Object Detection



Customized Object Detection



APIs

Luxand Face Recognition