High-Level Architectural Design
Identif.ai

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Contents

List of Tables

1 Introduction

This section should provide an brief overview of the entire document.

1.1 Purpose

The purpose of this document is to provide an overview of the high-level Architecture Design for the application Identif.ai. This document is derived using the requirements and specifications of the application which will help structure the application. The intended audience of this document are any stakeholders, including the developers, the maintenance team, the professor(Dr. Ridha Khedri) and the teaching assistants(Andrew Le Clair and Spencer Deevy) of the course.

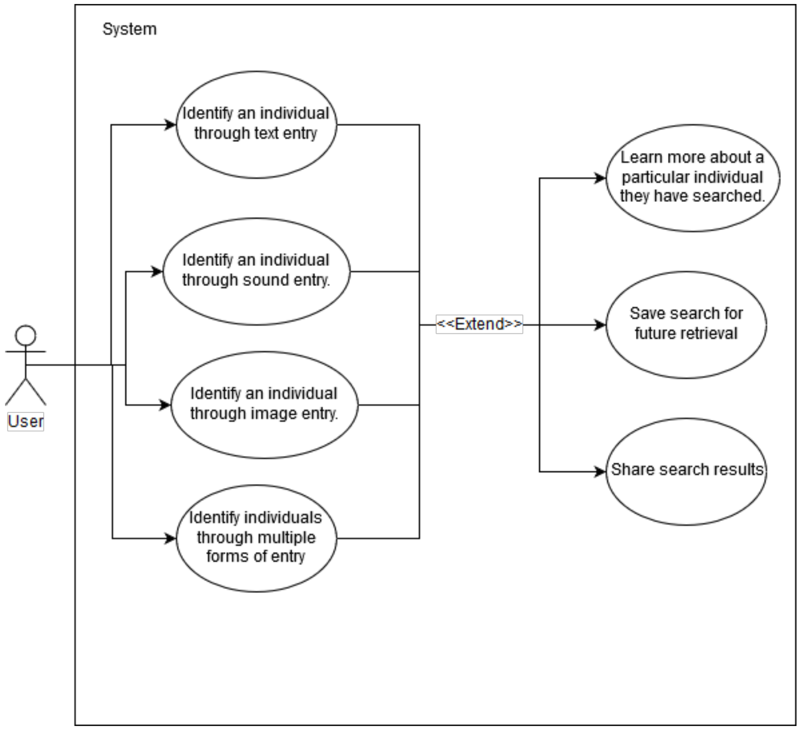
1.2 System Description

Identif.ai is an android application that identifies celebrities through multimedia input such as audio, photo, and text. Within the system there are three experts corresponding to each individual input. The information from each input will then be sent to their respective subsystems where identification is attempted. There will be a Main controller that will handle majority of the tasks and the transfers of the data within controllers and models.This document will decompose the system and show the models, controllers and views interact with each other.

1.3 Overview

This document is organized into four sections, Use Case Diagram, Analysis Diagram, Architecture design and the Class Responsibility Cards. These will provide a high level representation of the architectural design as well as justification of the design choices. The Use Case Diagram models how the user or actors interact with the system. The Analysis Diagram provides an overview of the classes and subsystems within the application as well as how they interact. Section three outlines the application's architectural design decisions and the reasoning behind them. Lastly, the class responsibility collaboration cards provide a summary of each identified class's responsibilities and their collaborators.

2 Use Case Diagram


System
Identify an individual through text entry
Identify an individual through sound entry.
Identify an individual through image entry.
Identify individuals through multiple forms of entry
User
<<Extend>>
Learn more about a particular individual they have searched.
Save search for future retrieval
Share search results

- **UC1 Identify an individual through text entry:** The user has decided to use only input text to attempt identification. The system will only use the text expert.

- **UC2 Identify an individual through sound entry:** The user has decided to use only sound input to attempt identification. The system will only use the sound expert.

- **UC3 Identify an individual through image entry:** The user has decided to use only an image input to attempt identification. The system will only use the image expert.

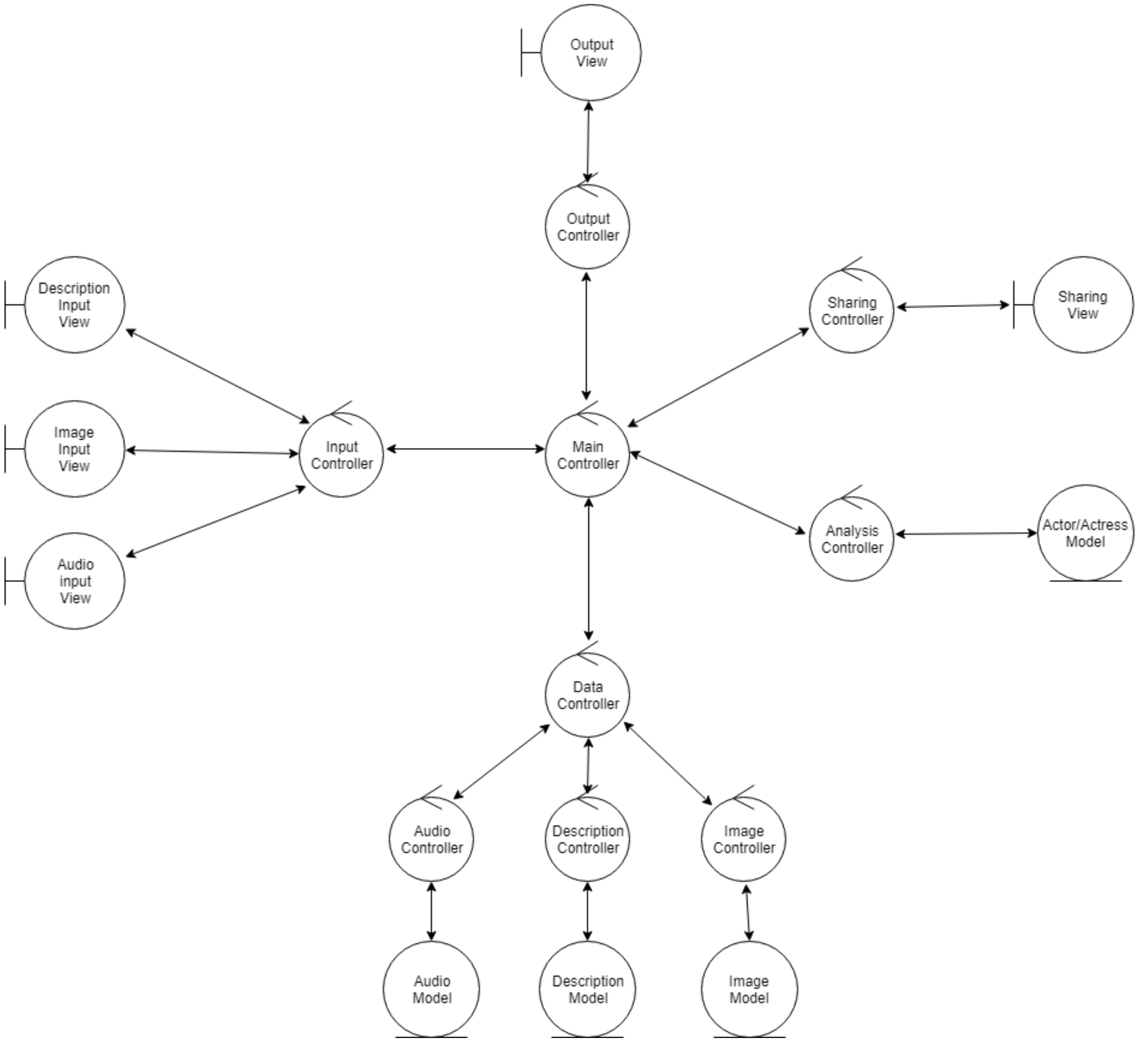
- **UC4 Identify individuals through multiple forms of entry:** The user has decided to use multiple forms of input. The system will use the appropriate experts.

- **UC5 Learn more about a particular individual they have searched.:** The user has decided that they would like to learn more about one of the people from their search. The system will provide links to various information sites.

- **UC6 Save search for future retrieval:** The user has decided that they would like to save the results of their search for later. The system will store their data.

- **UC7 Share search results:** The user has decided to share the results of their search. The system will share the results to the selected social media service.

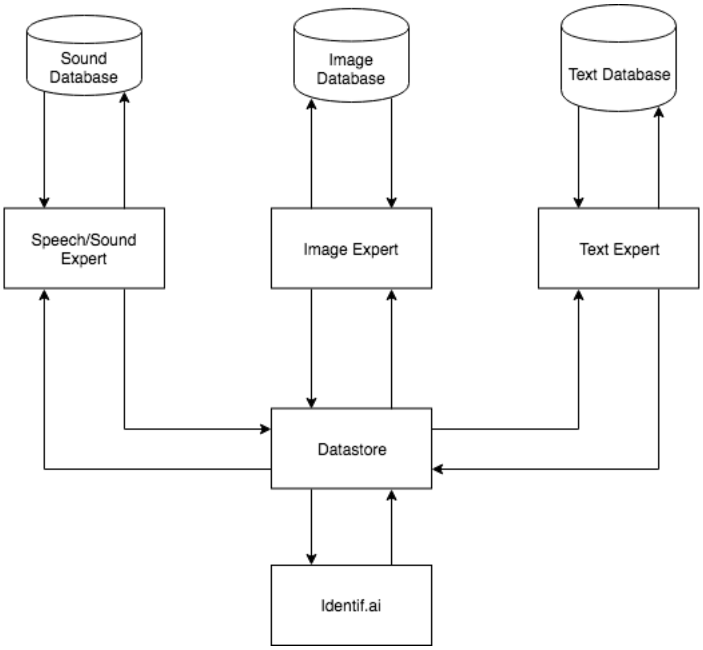
3 Analysis Class Diagram



4 Architectural Design

4.1 System Architecture

The Identif.ai application will leverage the Blackboard Architecture Style to perform the necessary functionality. There will be three knowledge sources, called *Experts*, to provide analysis on the inputs the user has made and consists of the *Speech/Sound Expert*, the *Image Expert* and the *Text Expert*.
Blackboard was chosen for this application because identifying an individual through mechanisms in a mobile device is a non-deterministic problem that may not have a clear answer. Blackboard will allow the application to have many reusable, interchangeable knowledge sources to assist with analysis of data given by the application user.



4.2 Subsystems

- **Identif.ai:** This subsystem will contain the main application logic which includes the user-interface logic. The system will take user input from the application and store it in the datasource for knowledge experts to retrieve from. Once knowledge experts have finish analysis, this system will display the results to the user.

- **Datastore:** This subsystem is responsible for providing a central forum for knowledge experts to retrieve data and put data in.

- **Speech / Sound Expert:** This subsystem is responsible for analyzing sound data that is provided by the user of the application. It is responsible for parsing the sound data and finding a similar match in the Sound Database. This system will send the results to the datastore for the application to use.

- **Sound Database:** The sound database subsystem is responsible for storing a collection of sounds for the Speech/Sound expert to use.

- **Image Expert:** This subsystem is responsible for taking image input from the user and cross referencing with the image database to find the closest match resembling the user's input. This system will send the results to the datastore for the application to use.

- **Image Database:** The image data subsystem is responsible for storing a collection of reference images for the Image expert to use.

- **Text Database:** This subsystem is responsible for taking text input from the user and using the text database to find the closest match and sending that data back to the application.

- **Text Database:** This subsystem contains the collection of actor lines with data about to corresponding actor. The database is accessed using the text expert.

5 Class Responsibility Collaboration (CRC) Cards

Class Name: Main Controller	
Responsibility:	**Collaborators:**
Handles data requests	Input Controller
Handles transfers between input, output, sharing, analysis, event and data controllers	Input Controller Output Controller Sharing Controller Analysis Controller Data Controller

Table 1: CRC for Main Controller

Class Name: Input Controller	
Responsibility:	**Collaborators:**
Receives the input from users	Description View Input View Audio Input View
Sends input data to main controller for further transfer to different handlers	Main Controller

Table 2: CRC for Input Controller

Class Name: Output Controller	
Responsibility:	**Collaborators:**
Compiles data of identified individual	Main Controller
Sends identified individual's data	Output View
Receives analysis results	

Table 3: CRC for Output Controller

Class Name: Output View	
Responsibility:	**Collaborators:**
Handles display of identification results	Output Controller
Receives and displays compiled data of identified individual	

Table 4: CRC for Output View

Class Name: Sharing Controller	
Responsibility:	**Collaborators:**
Receives request to share identification results	Main Controller
Sends share requests to social network APIs	Main Controller
Displays results of share request	Sharing View

Table 5: CRC for Sharing Controller

Class Name: Analysis Controller	
Responsibility:	**Collaborators:**
Compiles the results from the description, image, and audio controllers	Main Controller
Selects the optimal results and sends it to the main controller for output	Actor Model

Table 6: CRC for Analysis Controller

Class Name: Actor Model	
Responsibility:	**Collaborators:**
Holds the information of the actor type	Analysis Controller

Table 7: CRC for Actor Model

Class Name: Data Controller	
Responsibility:	**Collaborators:**
Sends analysis results	Main Controller
Handles storage of search results	
Receives input data and sends them to their respective experts for processing and analysis	Audio Controller Description Controller Image Controller

Table 8: CRC for Data Controller

Class Name: Audio Controller	
Responsibility:	**Collaborators:**
Based on the audio input, sends search request to the specified API	Audio Controller
Handles the response message from the API	Audio Model
Sends back the results	Data Controller

Table 9: CRC for Audio Controller

Class Name: Audio Model	
Responsibility:	**Collaborators:**
Holds the information of the audio type	Audio Controller

Table 10: CRC for Audio Model

Class Name: Description Controller	
Responsibility:	**Collaborators:**
Based on the input, sends search request to The Movie Database API	Description Controller
Handles the response message from the API	Description Model
Sends back the result to the data controller	Data Controller

Table 11: CRC for Description Controller

Class Name: Description Model	
Responsibility:	**Collaborators:**
Holds the information of the description type	Description Controller

Table 12: CRC for Description Model

Class Name: Image Controller	
Responsibility:	**Collaborators:**
Based on the input, sends search request to The Cloud Vision API	Input Controller
Handles the response message from the API	Image Model
Sends back the result to the data controller	Data Controller

Table 13: CRC for Image Controller

Class Name: Image Model	
Responsibility:	**Collaborators:**
Holds the information of the description type	Image Controller

Table 14: CRC for Image Model

Class Name: Description Input View	
Responsibility:	**Collaborators:**
Handles the user interface for text description inputs	Input Controller

Table 15: CRC for Description Input View

Class Name: Image Input View	
Responsibility:	**Collaborators:**
Handles the user interface for image inputs	Input Controller

Table 16: CRC for Image Input View

Class Name: Audio Input View	
Responsibility:	**Collaborators:**
Handles the user interface for audio clip inputs	Input Controller

Table 17: CRC for Audio Input View

Class Name: Sharing View	
Responsibility:	**Collaborators:**
Handles the user interface for sharing on social media	Sharing Controller

Table 18: CRC for Sharing View

A Division of Labour

Name	Contribution	Signature
Alex Nguyen	Section 4.1 and 5	
Junni Pan	Section 3 and 5	
Sullivan Stobo	Section 2 and 5	
Tommy Tran	Section 5 and 4.2	
Shalmi Patel	Section 1 and 5	