SW Engineering CSC648/848

PosFit

Your Virtual Fitness Coach

Prepared by Team 03

1. **Zack Wang** **(zwang14@mail.sfsu.edu)**
2. **Minseon Park** **(mpark5@mail.sfsu.edu)**
3. **John San Jose** **(jsanjose@mail.sfsu.edu)**
4. **Jason Cordis** **(jcordis@mail.sfsu.edu)**
5. **Brian Frey** **(bfrey@mail.sfsu.edu)**
6. **Vincent Wong** **(vwong5@mail.sfsu.edu)**
7. **Darshil Dhameliya** **(ddhameliya@mail.sfsu.edu)**

Milestone 2

Oct. 22, 2021

Revision History Table

Revisions	Revision Date	Summary
V1	10/22	First draft
V2		
V3		

1. Data Definitions V2

Primary Data Name	Definition (& Examples)	Usage
Registered_Users	A person who has signed up with Posfit either as a Certified Coach or a Posfit user.	Information such as the email, username, password, user-bio, comments, and videos will be stored. User bios will be available for other registered users to view.
Joint_Position	Output of the AI after AI has received video input.	Registered users will see the Joint_Position and receive a report about the overall fitness efficiency based on how their Joint_Position compares to the optimal Joint_Position
Video	Videos made by the user that are either uploaded from the device or recorded via webcam.	Videos can be viewed and commented on by registered users. Videos are analyzed by the AI to output the Joint_Position shown in the video.

Data Definition Continued:

Primary Data Name	Sub-Data
Video	● video ID ● video-description ● comments ● search-term ● title ● date of publish ● thumbnail ● category

Joint-Position	• user-joint-position • optimal-joint-position
Registered_User	• user ID • profile picture • status • username • email • password • user-bio • a collection of videos ID

2. Functional Requirements V2

	Must-have		Desired		Opportunistic

Priority	Functional Requirement Description	Details (As Needed)
	User Account Creation and Deletion	• Users should be able to register an account with a unique username and password. • Users should be able to delete an existing account given a unique username and password. • Users should be able to identify themselves as a

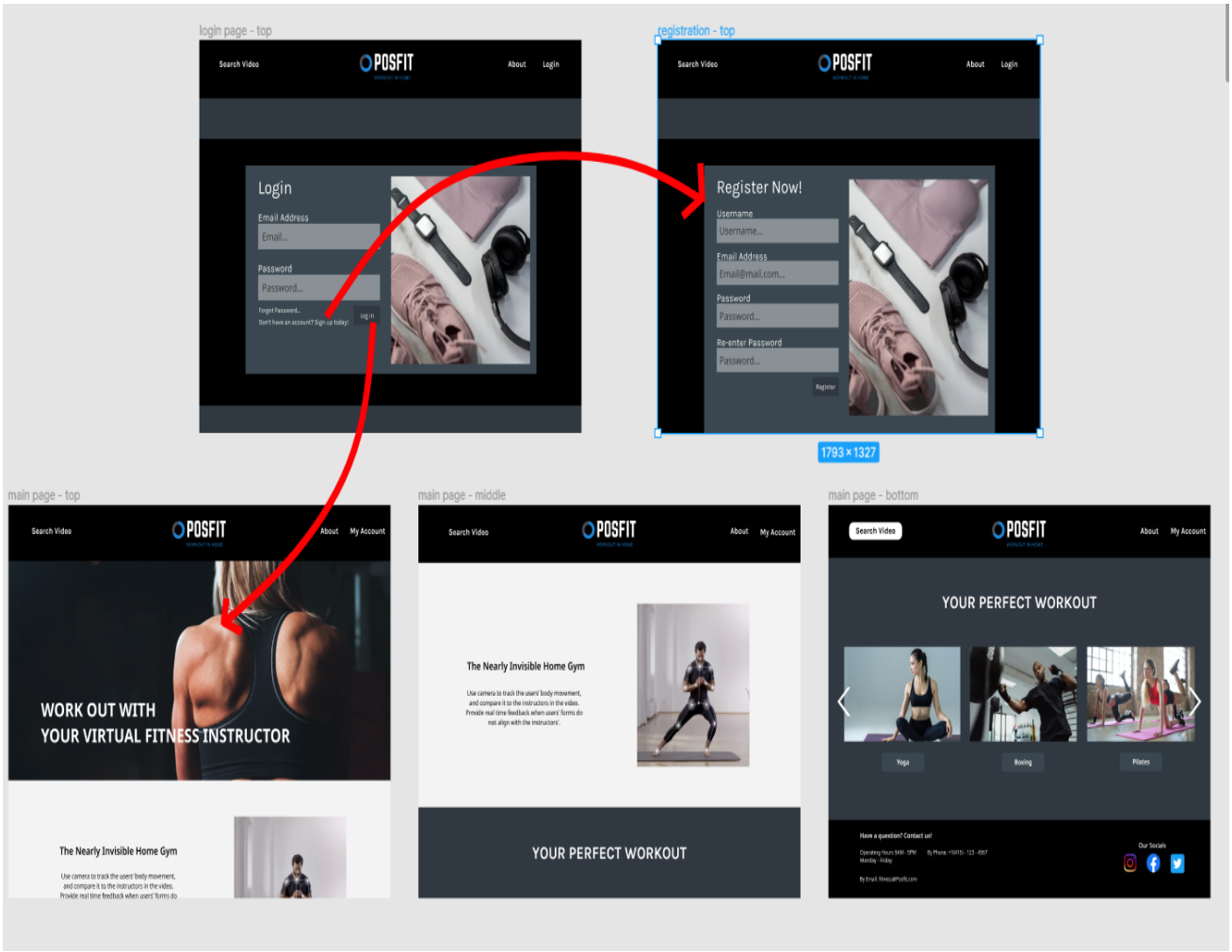
		Registered_Coach or Fitness Instructor with verification by uploading verified documents. ie) degrees, certificates, etc.
	Users Log In/Out.	• User's able to log in to their account via a login page where they'll need to use their unique username and password. • User's able to log out of their account via the user-page using a button.
	User Personalization. (Extendable)	• Users should be able to log in a biography telling something about themselves.
	User Video Management.	• Users can upload and delete their videos via their User page. • Users can categorize their video. • Users can optionally add a description upon uploading a video. • User's able to record a video and upload it via a simple web camera located on most if not all modern devices. (Competitive Advantage over: Forme, Tonal, Mirror.co)
	Video Interaction (Extendable)	• Users can view their video or other users' videos via the video-playing page (similar to youtube) which is unique to each video. • Registered_Coaches/Fitness_Instructors are able to make comments in the comments section of the video playing page.

	Artificial Intelligence/Machine Learning Video Feedback (Main Competitive Advantage)	• ML model is able to take a user's video and output the same video but with key Joint_Positions identified and highlighted if misaligned given a specific exercise. ie) uneven shoulders in squats, improper hip placement in a golf swing, etc. • Input: .mp4 video format, where the video shows a person doing a specific exercise. • Output: a modified .mp4 input that highlights Joint_Positions.
	Video Searching	• Videos are searchable through the search field in the search page. • Users are able to search videos given a Category in the search page. • User's are suggested certain trending videos.
	Video Interaction (Extended)	• User's are able to like/dislike a video • User's are able to share a video to a 3rd party application ie) Facebook, Instagram, Twitter, etc. • Have all users be able to comment on videos but be able to differentiate between a regular user versus a verified Fitness Instructor or Registered_Coach
	User Personalization. (Extended)	• Users will be able to change their password by going into their User page and entering their old password and creating a new password. • Users can change the background overall theme of their User Page • Users should be able to specifically determine which specific categories of exercises they're interested in and display it on the user page.

	Progress Tracking	• Users will be able to track their app usage and fitness progress to achieve a designated goal via some game mechanic

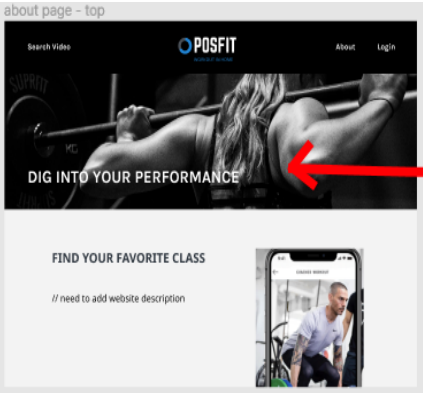
3. UI Mockups and Storyboards (high level only)

(Login/Registration/Home Page)

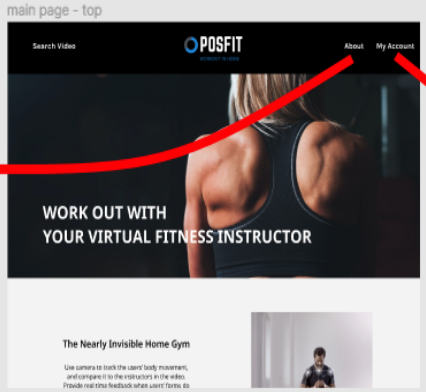


(Home/About/User page)

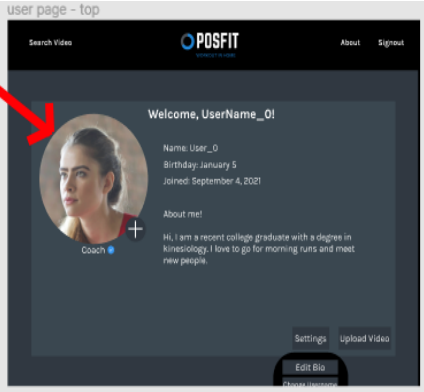
about page - top



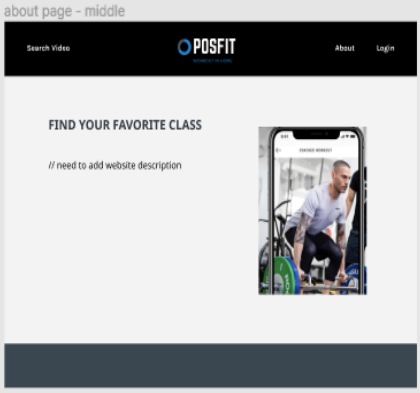
main page - top



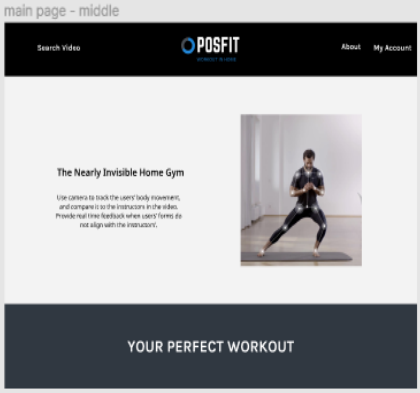
user page - top



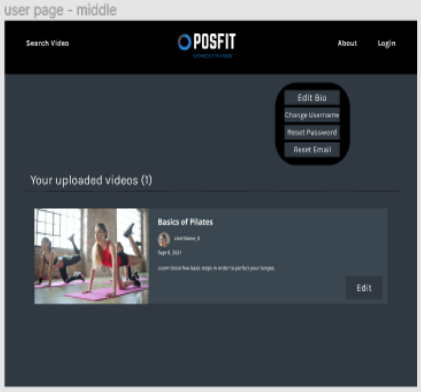
about page - middle



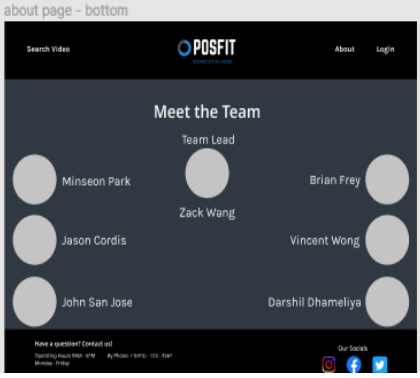
main page - middle



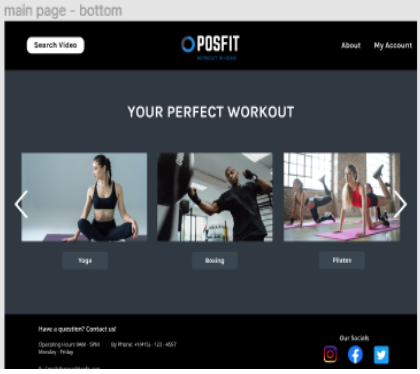
user page - middle



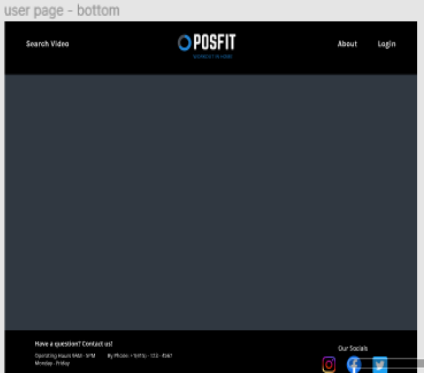
about page - bottom



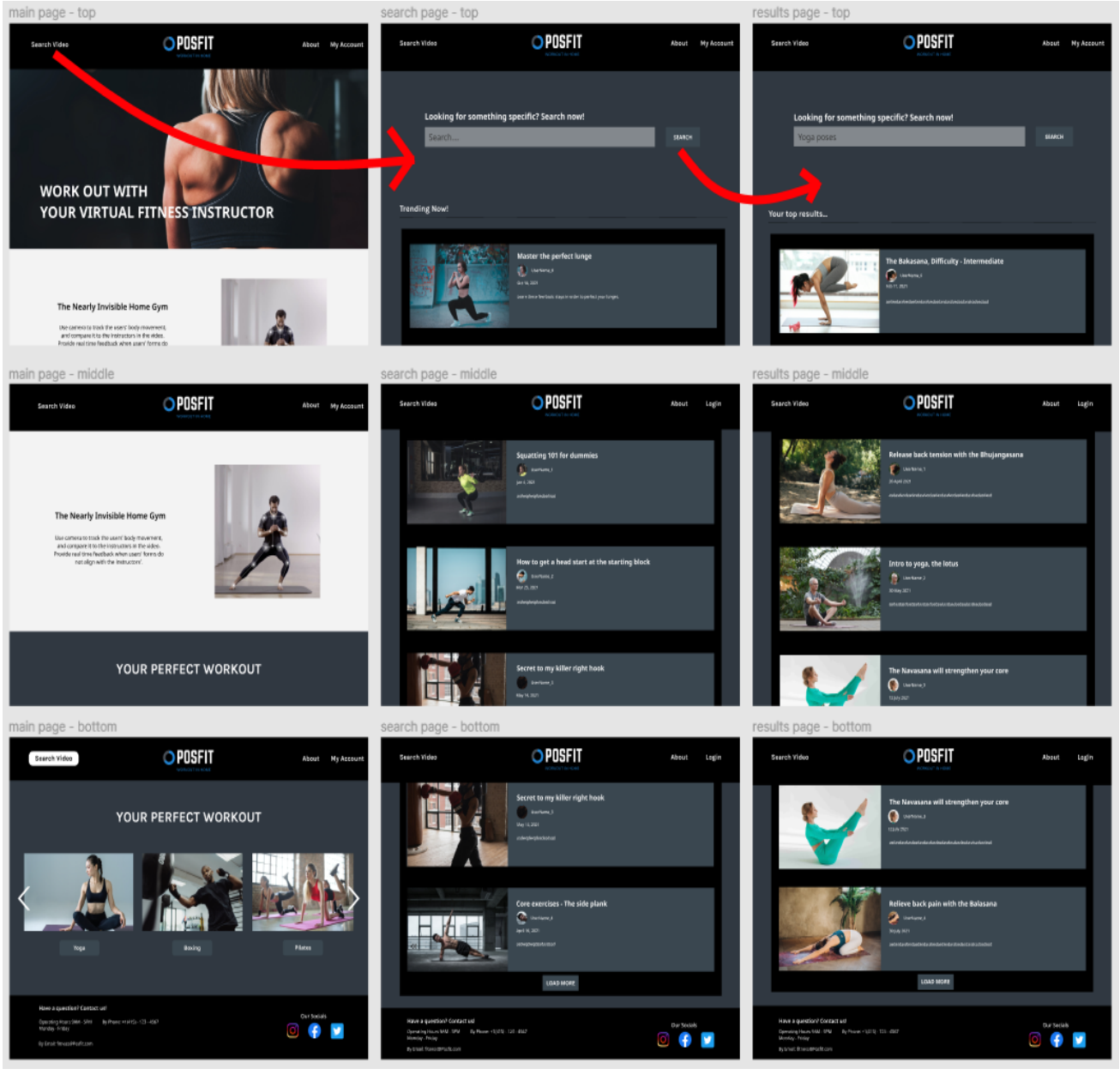
main page - bottom



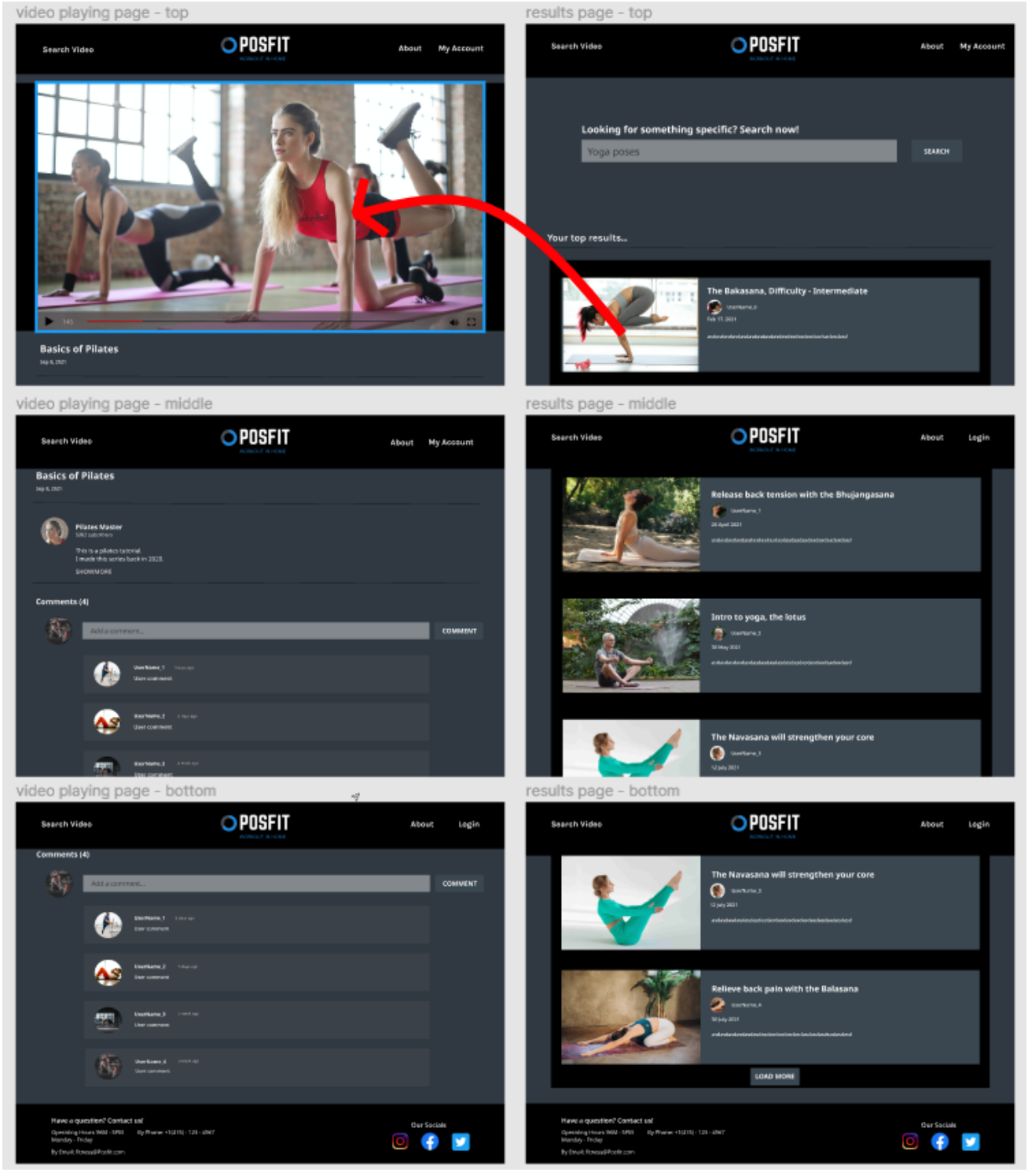
user page - bottom



(Main/Search/Results Page)



(Results/Video playing page)



4. High-level Architecture, Database Organization

We have two databases: AWS S3 and AWS DynamoDB. AWS provides SDK and allows our front-end component to establish connections to the database. Within our application, we have two unique keys: accessKeyId and secretAccessKey. These two keys are confidential and allow us to pass AWS's authentication step when we need to access our database. One advantage of AWS Dynamo is that it has auto-scaling mechanism when we reach certain level of usage.

S3and DynamoDB work differently. S3 has no structure and is for storing large files, such as images and videos. DynamoDB is a No-SQL database. We use it to store all information other than images and videos.

AWS S3 Bucket
videos
images

DynamoDB contains two tables: User and Video.

DynamoDB -- User
Username
User_id
User_bio
Playlist
Video_id
User_type

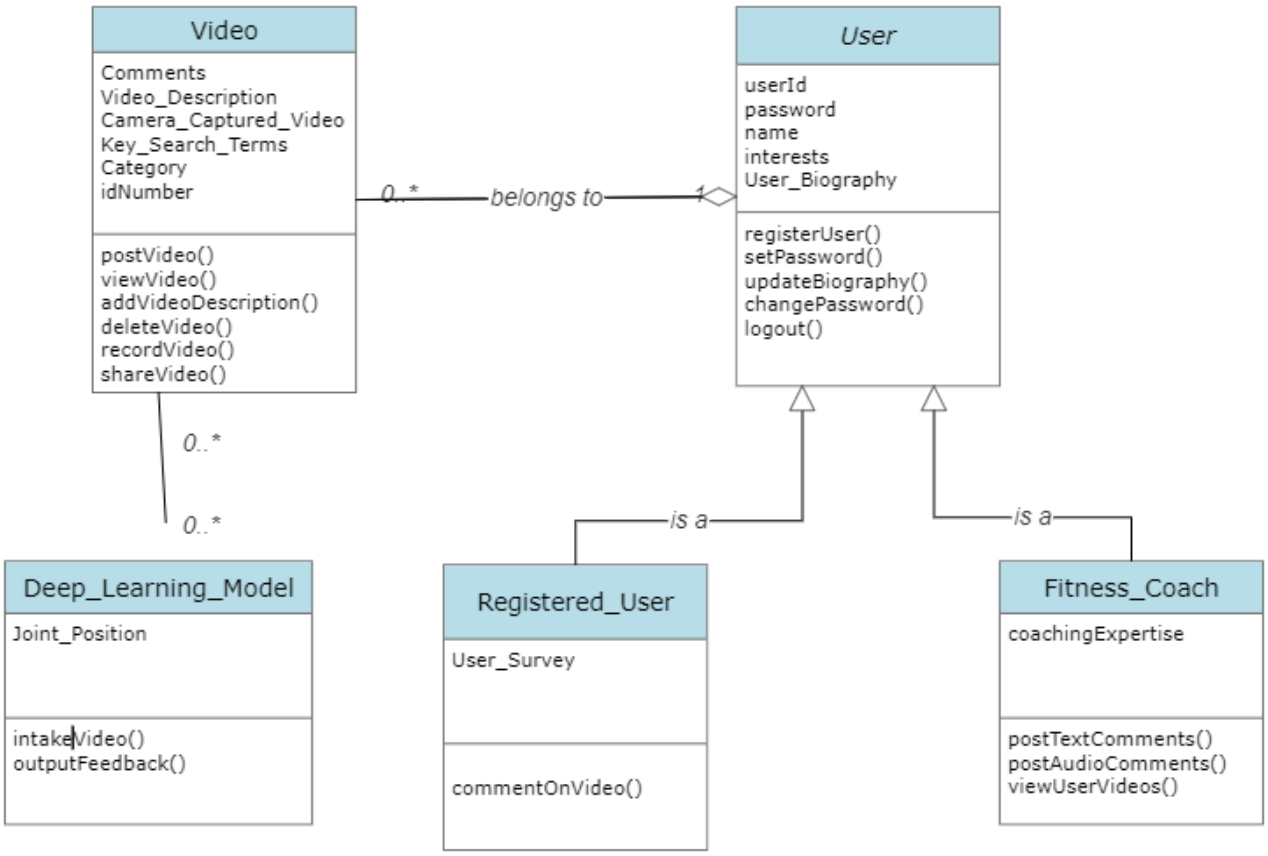
DynamoDB -- Video
Video ID
Title
Creator_name
Date_of_publish
Video_description
Comment
S3 URL
Category
Video image S3 URL

Add/Delete/Search architecture	*Functional Requirement*
Add / Delete User's information	When a new user is joined or when user deletes account
Add / Delete User's playlist	When users add or delete videos into his or her playlist
Add / Delete Videos / Images	When user upload / delete their videos

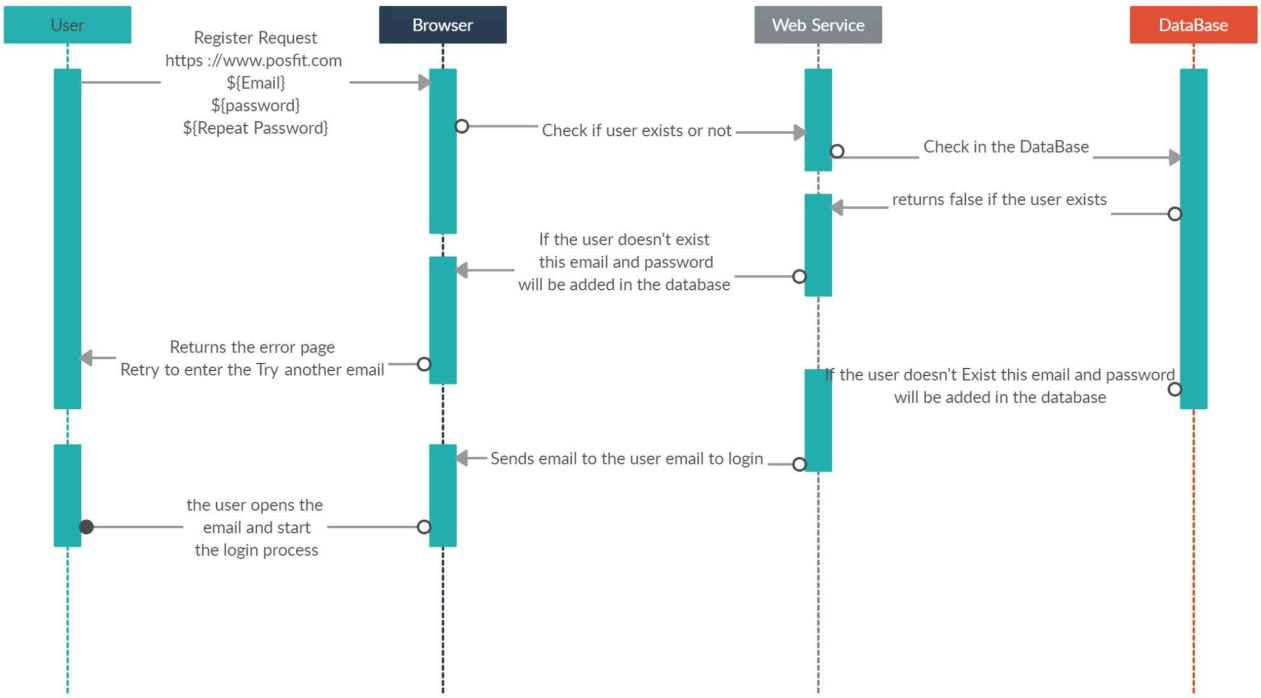
Add / Delete Metadata	When videos are uploaded / deleted
Search based on category	When user searches videos by categories
Search based on video title	When user searches videos by title
Search based on creator	When user views a specific content creator's videos

5. High-level UML Diagrams

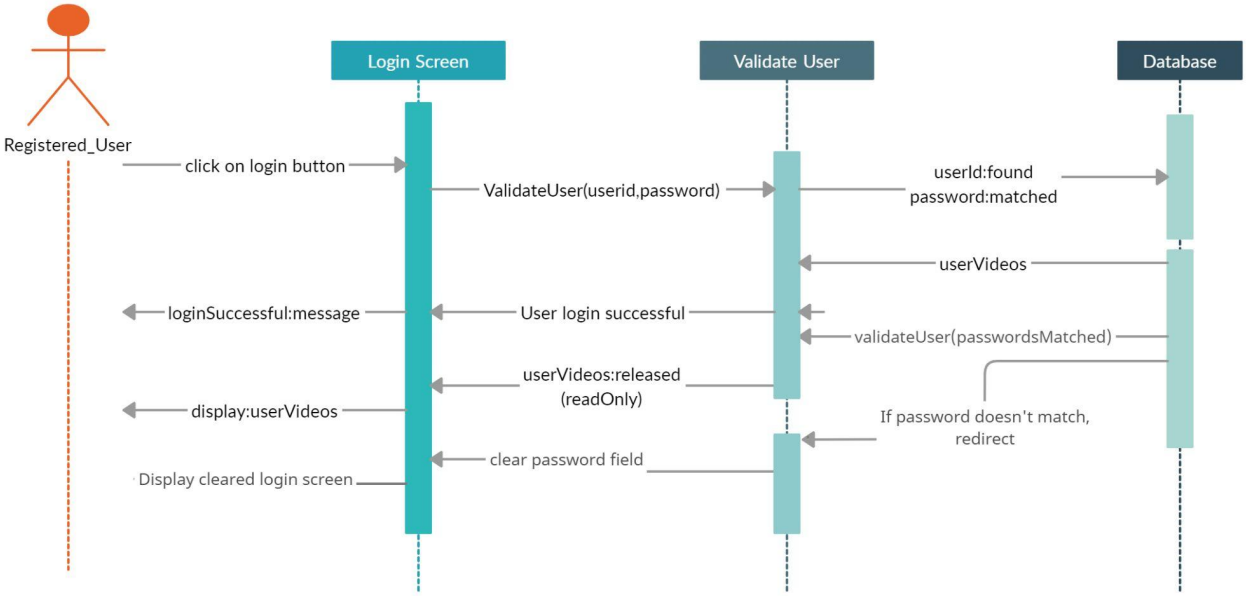
High-level UML class diagram

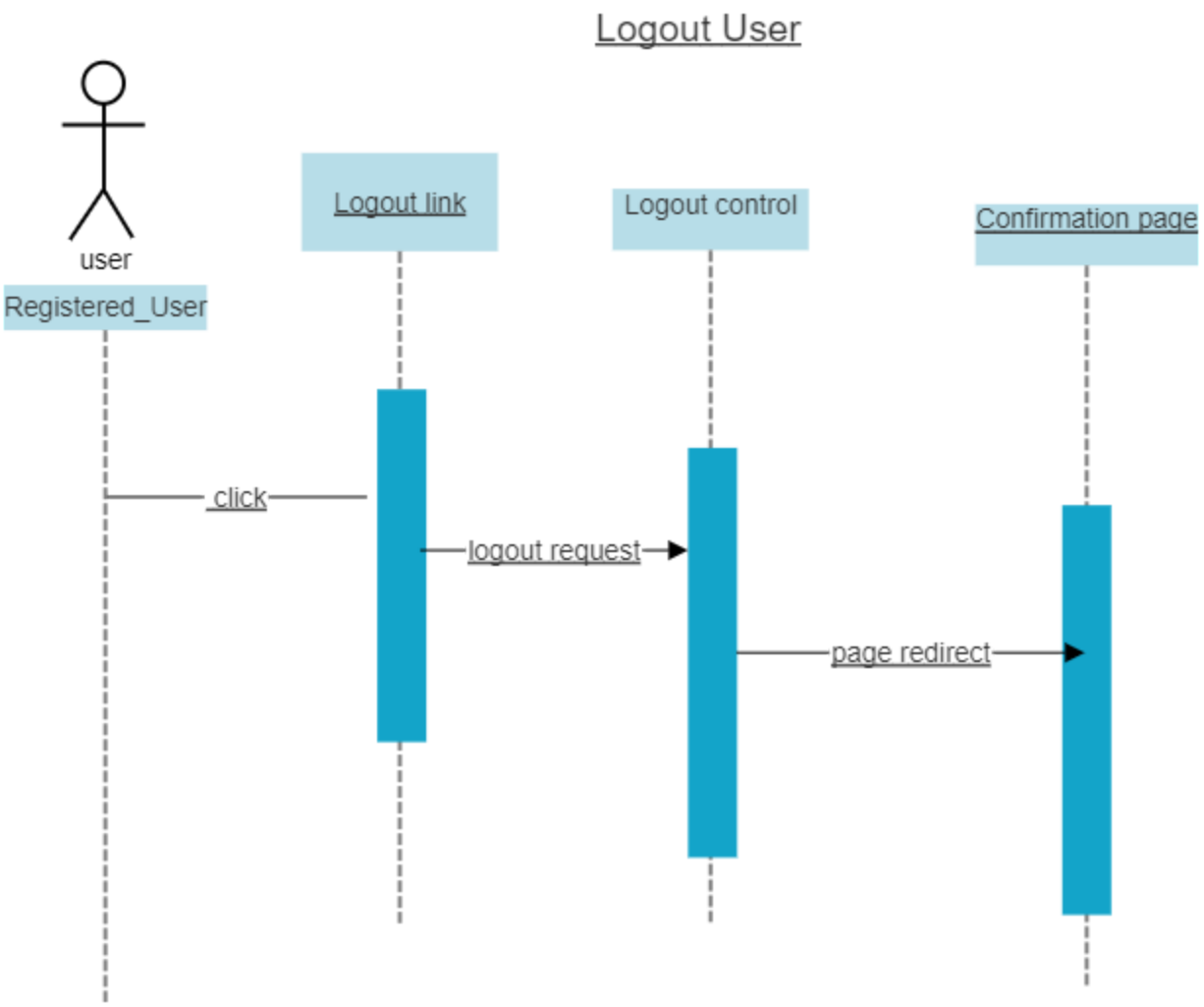


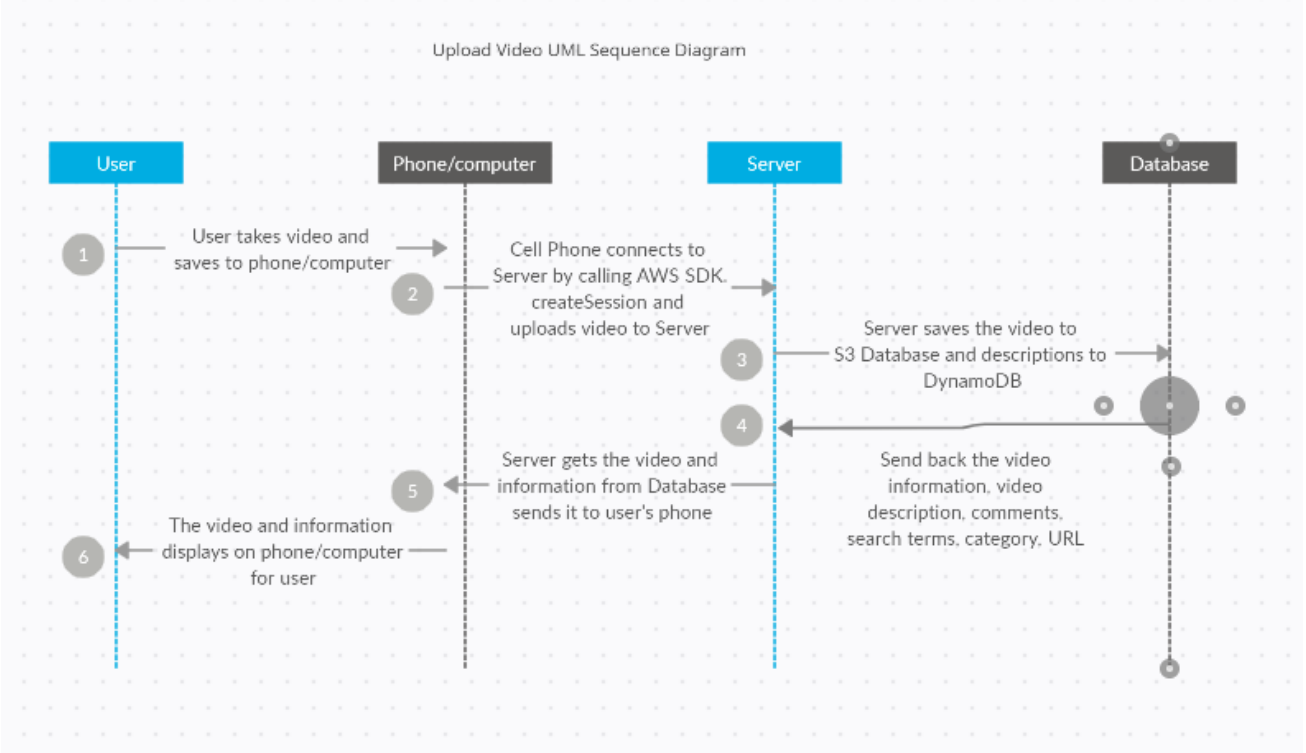
User Registration Sequence Diagram

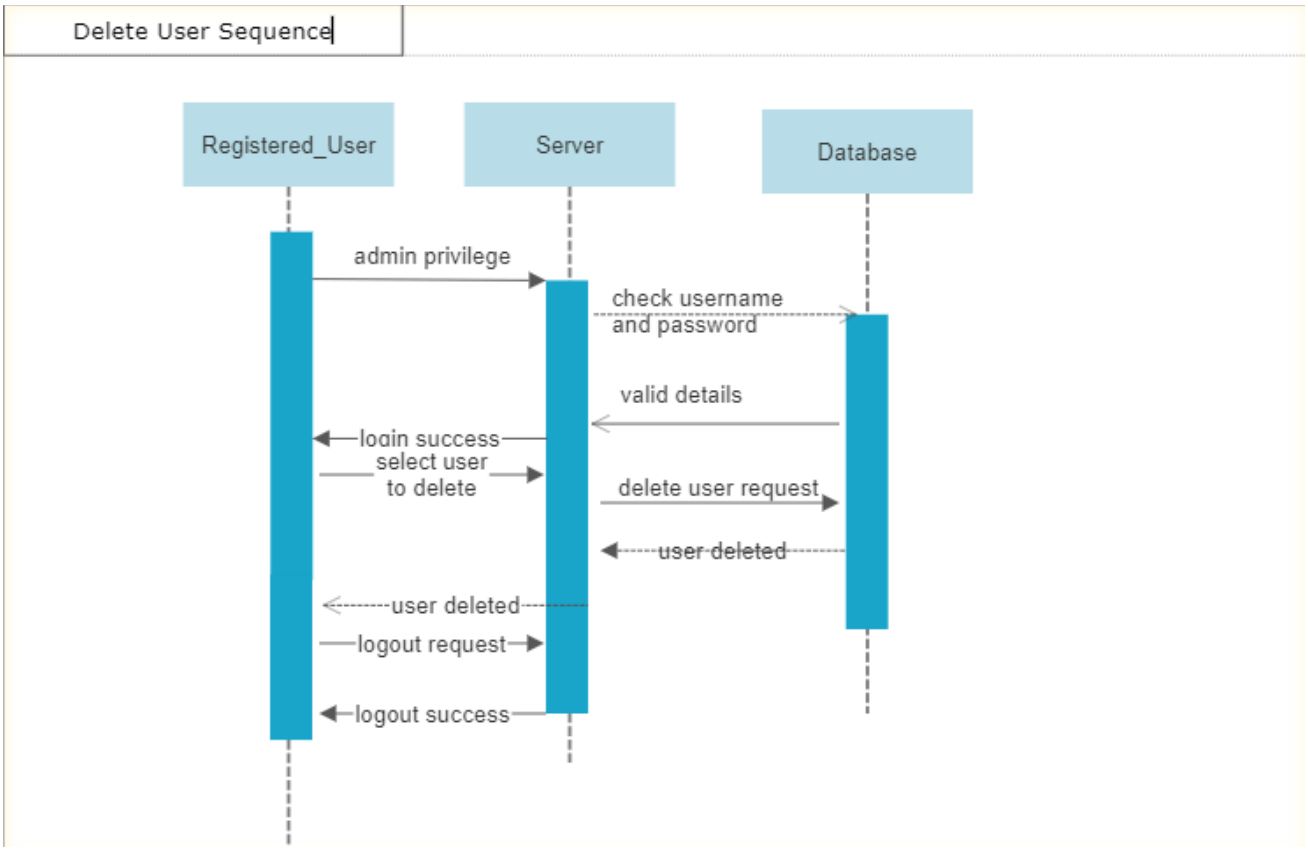


User Login Sequence Diagram




Logout User
user
Registered_User
Logout link
Logout control
Confirmation page
click
logout request
page redirect


Upload Video UML Sequence Diagram
User
Phone/computer
Server
Database
1
User takes video and saves to phone/computer
2
Cell Phone connects to Server by calling AWS SDK. createSession and uploads video to Server
3
Server saves the video to S3 Database and descriptions to DynamoDB
4
Send back the video information, video description, comments, search terms, category, URL
5
Server gets the video and information from Database sends it to user's phone
6
The video and information displays on phone/computer for user



6. Identify actual key risks for your project at this time

A. Skills Risk

Our SCRUM master held a few study sessions for the group, and we have provided many learning resources to the members. The members have developed essential skills to start the project and have the knowledge of knowing where to find more information if they encounter any technical problems.

We also embrace the concept of learning by doing. The difficulty of weekly tasks is gradually increasing. The weekly plan is to help members to be comfortable with web development step by step.

B. Schedule Risk

Since our group size is relatively small, progress tracking is manageable. Therefore, we are not planning to use any management tool for now.

The project is broken down to weekly tasks. Team lead also announces the tasks every Monday. So, everyone is clear about their tasks and where they are standing.

C. Teamwork Risk

We had the risk for the past two weeks, but the damage is near to zero for now because we have an open communication channel on Discord. We also record all the meetings

and share them in the group.

Our members work in sub-groups, so they always have at least one person to work with. This structure is very effective when a technical difficulty occurs. And, we always have the SCRUM master jump between teams if any team needs more help to keep the progress on track.

D. Legal / Content Risk

We are using an existing code base for our AI model. For now, this risk is very low because the project is not for production. We are still testing many AI models. OpenPose is included in OpenCV. So, we can always switch our AI model to OpenPose if the legal risk becomes high.

7. Project Management

We meet three times a week. One is on Monday, one is on Wednesday, and the other one is on Sunday. Our group has a very open communication channel. We communicate frequently on Discord.

The typical flow of our week meeting is the following. Team lead announces weekly tasks and assigns the tasks to each sub-team. We currently have 7 members, including the team lead. Three sub-teams -- User Team, Video Team, and AI team, and each sub-team contains two members. The SCRUM master is not in any team. He jumps between User Team and Video Team depending on the load of tasks in that week.

On Wednesday, the team lead goes over implementation details and answers questions from members. Although we have no meeting scheduled on Friday, the SCRUM master will check with the members about their progress. On Sunday, we will integrate all the components, and each team needs to talk to the group about what they have done, what issues they have encountered, and how they solved it.

We are following the philosophy of Continuous Integration and Continuous Development. Therefore, we will merge all components on Sunday and make sure that the whole project is ready for the next development step.