



Sensor Data Visualization

Students: Tony Erazo (Team Leader), Luis Gil, Gentman Tan, Jonathan Diaz-Arencia, Alejandro Ruiz.

Mentors: Enshi Zhang, Raphael Trujillo, John Michael Templeton, Christian Poellabauer.

Instructor/Faculty: *Seyedmasoud Sadjadi*, PhD, Florida International University.



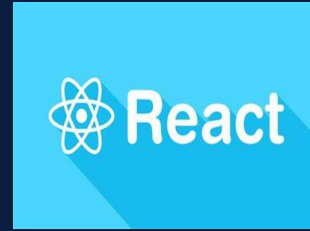


What is Sensor Data Visualization

With the ever-present need for greater amounts of user metrics, systems need to be put into place that allow for effective collection of user data. This is due to the wealth of knowledge that can be provided by the collection and analysis of data by researchers, in order to be able to conclude on topical issues. The scientific method is the backbone of the technology of the past and present, and tools for observation are essential in providing for such a methodology.



Tools and Technologies



FIU

Engineering
& Computing

FLORIDA INTERNATIONAL UNIVERSITY

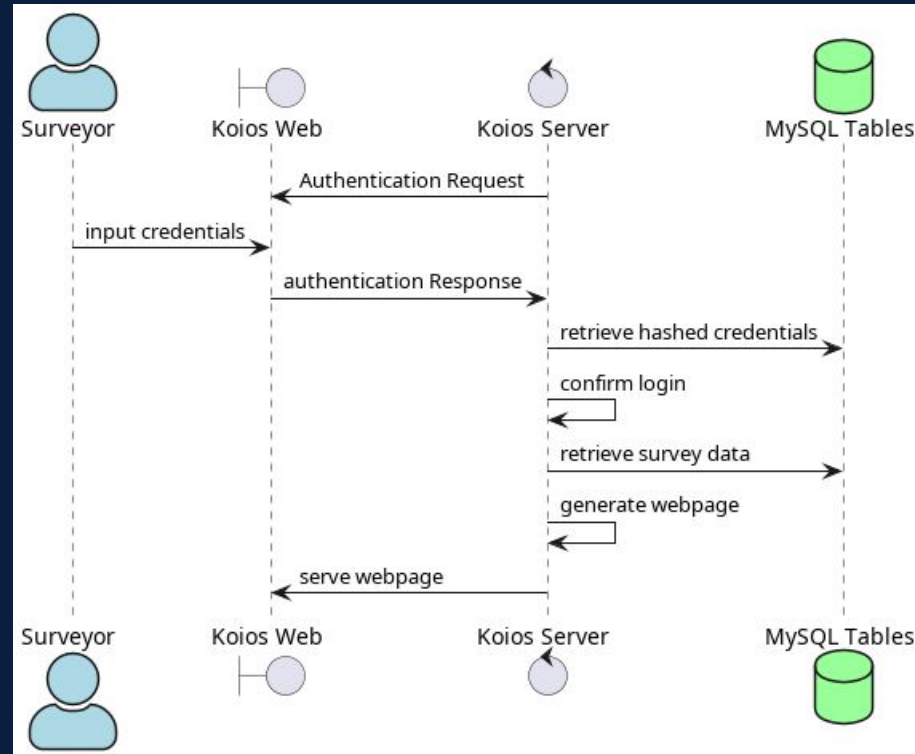


Goal of Koios Application

The main goal of Koios is to create a flexible tool that can be used for different types of research and can be expanded in the future. The main purpose is to manage different studies and act as a bridge between organizations and their specific sensing needs. This approach can improve the quality of data, particularly when resources are scarce, and also make it more cost-effective.

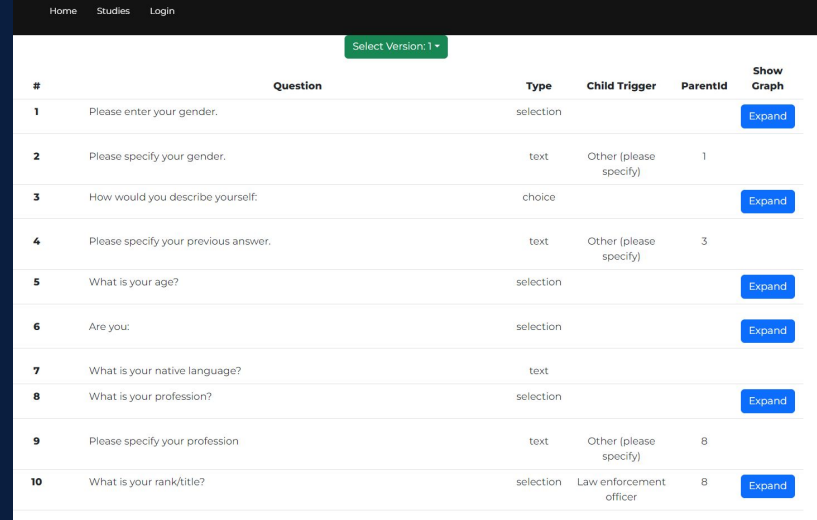


Minimal Sequence Diagram



Web Application

- The web application is the web page we shared during our first meeting.
- A study can be created, suspended, resumed, and deleted.
- We can also send different kinds of notifications to participants such as email and push notifications to remind participants to complete certain tasks/actions.

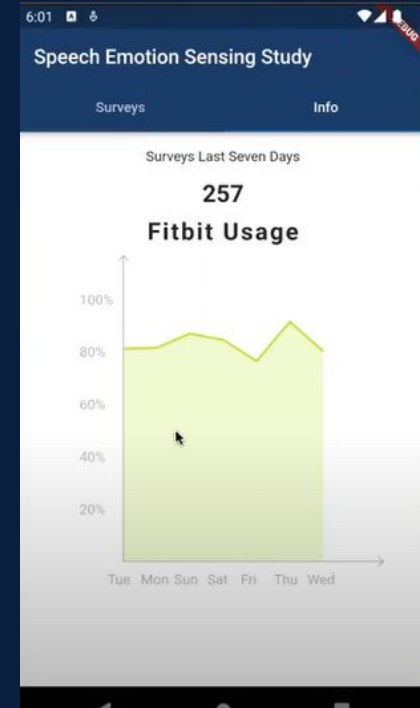


The screenshot shows a web application interface with a dark blue header containing 'Home', 'Studies', and 'Login' links. Below the header is a green button labeled 'Select Version: 1'. The main content area features a table with 10 rows of study questions. Each row includes a question number, the question text, the question type, a child trigger, a parent ID, and a 'Show Graph' button. The 'Show Graph' button is labeled 'Expand'.

#	Question	Type	Child Trigger	Parentid	Show Graph
1	Please enter your gender.	selection			Expand
2	Please specify your gender.	text	Other (please specify)	1	
3	How would you describe yourself?	choice			Expand
4	Please specify your previous answer.	text	Other (please specify)	3	
5	What is your age?	selection			Expand
6	Are you:	selection			Expand
7	What is your native language?	text			
8	What is your profession?	selection			Expand
9	Please specify your profession	text	Other (please specify)	8	
10	What is your rank/title?	selection	Law enforcement officer	8	Expand

Mobile Application

- User interfaces.
- Manages data and uploads them accordingly
- Current functions:
 - Joining study, Fitbit account integration, perform surveys, files upload



Server-Side Component

- Data Manager
- File manager
 - Uploads file to remote server
- Notification manager
- Stores metadata of all studies
- It also processes and stores data in our database.

enrollment_id	response_summary_id	study_id	survey_id	task_id	version	response_type	response	comm
2ad5dbc4-3050-4330-aa2d-33499bf0ec8d	402d2800-f5e3-4ce1-b953-29cc56ec0ac4	54	69	13	1	numberpicker	5	
2ad5dbc4-3050-4330-aa2d-33499bf0ec8d	402d2800-f5e3-4ce1-b953-29cc56ec0ac4	54	69	14	2	choice	Loss of i...	
2ad5dbc4-3050-4330-aa2d-33499bf0ec8d	402d2800-f5e3-4ce1-b953-29cc56ec0ac4	54	69	15	1	selection	No	
2ad5dbc4-3050-4330-aa2d-33499bf0ec8d	c690a3ee-9964-4833-b15c-6198e94074e1	54	69	16	1	text	Test	
2ad5dbc4-3050-4330-aa2d-33499bf0ec8d	402d2800-f5e3-4ce1-b953-29cc56ec0ac4	54	69	17	1	selection	No	
2ad5dbc4-3050-4330-aa2d-33499bf0ec8d	9b349f87-dbb9-4329-969d-94a4bc07ab1d	54	70	1	1	selection	Yes, via ...	
35df6e14-3a0d-4b4e-8c99-6ea135e73868	ff90fa9b-f501-45fc-8f00-a90d8be93895	60	88	2	1	recording		
35df6e14-3a0d-4b4e-8c99-6ea135e73868	ff90fa9b-f501-45fc-8f00-a90d8be93895	60	88	3	1	recording		
35df6e14-3a0d-4b4e-8c99-6ea135e73868	ff90fa9b-f501-45fc-8f00-a90d8be93895	60	88	4	1	recording		
35df6e14-3a0d-4b4e-8c99-6ea135e73868	ff90fa9b-f501-45fc-8f00-a90d8be93895	60	88	5	1	recording		
35df6e14-3a0d-4b4e-8c99-6ea135e73868	ff90fa9b-f501-45fc-8f00-a90d8be93895	60	88	6	1	recording		
35df6e14-3a0d-4b4e-8c99-6ea135e73868	ff90fa9b-f501-45fc-8f00-a90d8be93895	60	88	7	1	recording		



Wishlist

- Filter over the answers people have been giving over the previous week.
- Create an API endpoint that takes in the user's enrollment id and returns how many surveys they have completed in the study, and how many days they have worn the Fitbit.
- In Flutter, call the endpoint and then show those metrics on the main page.





Summary

- We have developed a comprehensive full-stack application that streamlines research studies and offers a wide range of features such as processing user data and monitoring health-based studies on the user.
- Our development process has covered various areas, starting from the planning phase to development, deployment, and security.
- We have also focused on data visualization for different studies and have taken into consideration the needs of the end-users while developing the mobile application.
- Additionally, we have extensively monitored the system after deployment and have highlighted the future work that needs to be undertaken to ensure the project's continued success.