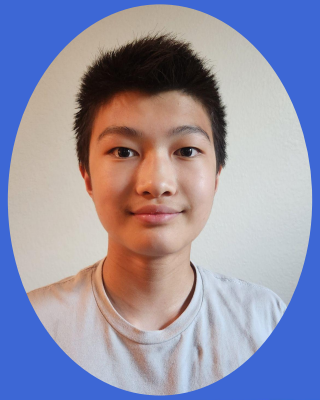
MIT APP INVENTOR

BandConnect

By William Zhou



SUMMER APPATHON

OVERVIEW

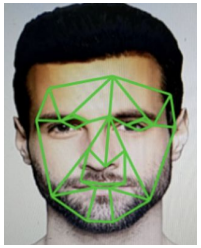
- **App Name:** BandConnect
- **App Description:** It is an app that helps band teachers distribute information and collect student data, uses the AI FaceMesh Model to preprocess face profiles, and allows teachers to pull student data from the app, approve student instruments and class assignments, and use ChatGPT to get information. It significantly improves the efficiency of the current band recruitment process by five times.
- **Track:** Youth Individual
- **Category:** Education & Research

THEME

My project's theme is education. When I was in middle school, my favorite teacher, Mr. Tucker, the school band director, was pressured to distribute and collect information from students, especially during the 6th-grade instrument selection process, which involved exchanging multiple emails about jaw structure and face shape pictures, noting height and arm length, etc.

I designed this end-to-end application, BandConnect, so band teachers can distribute their requests to students and collect the information seamlessly in time; this application also uses technology such as FaceMesh to help with the instrument fitting process and ChatGPT for resources. Teachers can approve or decline students' requests and submissions by clicking buttons instead of multiple emails.

TECHNOLOGIES USED



Materials:

- Facemesh extension
- Firebase DB
- Tiny Web DB
- ChatBot component

Firebase

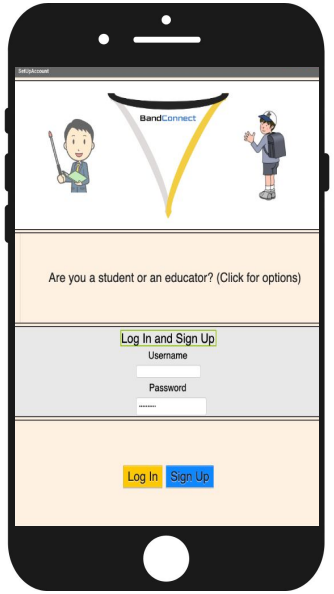
ChatBot

TinyWebDB1

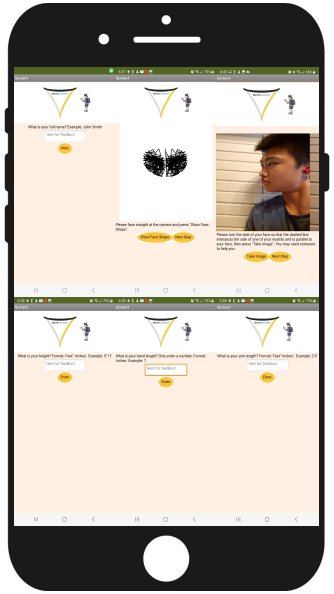
Testing the App:

- MIT AI2 Companion version 2.67 Application
- Android 13 with One UI 5.1 Software

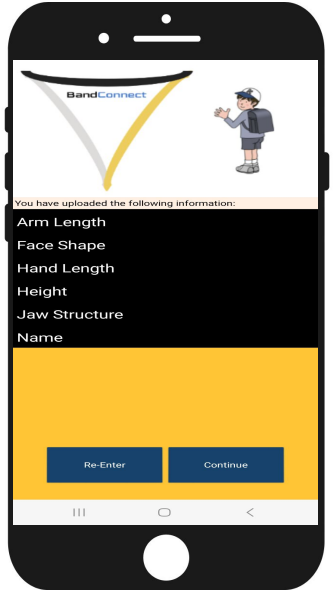
INSTRUCTIONS



Step 1: Set up your account by identifying yourself as a student or educator

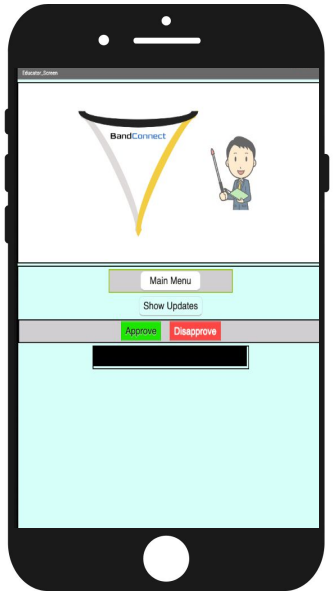


Step 2: Enter information for instrument selection; FaceMesh is used to detect face features, which helps the teacher decide.

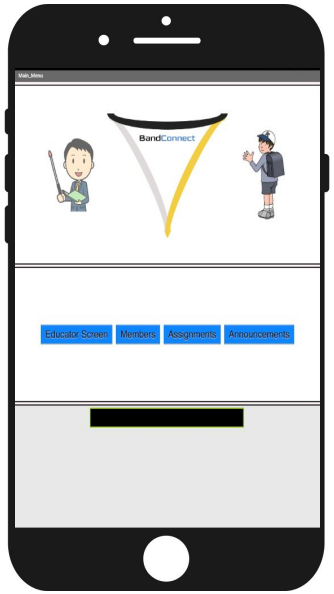


Step 3: Confirm information and submit or redo.

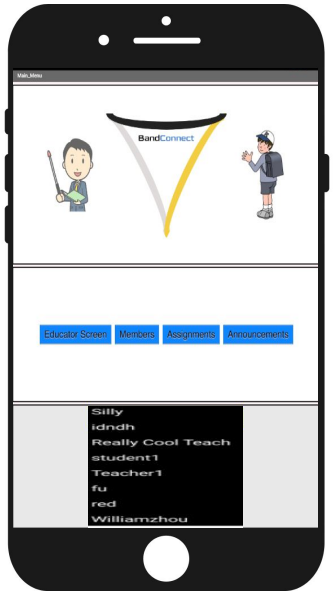
INSTRUCTIONS



Step 4: If you are a teacher, view students' information to decide if they are able to play an instrument, and use the "Approve" and "Disapprove" buttons to enter your decision.

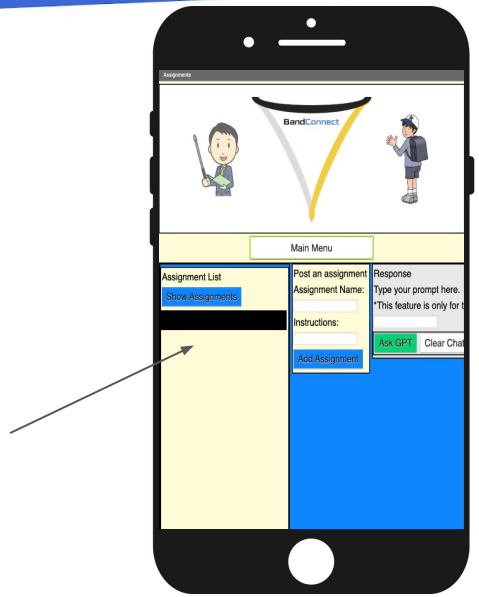


Step 5: This is the main menu, to view a list of members, or go to the assignments page or announcement page. If you are an educator, you can also go to the educator's screen to manage members.

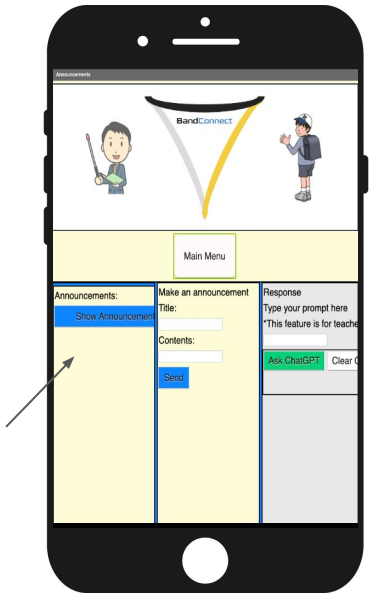


Step 6: If you press "Members," you will be shown a list of other users in your class to keep track of students.

INSTRUCTIONS



Step 7: In the assignments page, students can view posted assignments and teachers can post and grade assignments from students.



Step 8: In the announcements page, users can view and post and teachers can use Chat GPT to help type announcements or find resources.

LIMITATIONS

- The number of prompts the ChatGPT feature can respond to is limited, so users may have to use it sparingly.
- Image sizes can be as large as 5 MB depending on users' devices, and FireBase DB has a size-limitation of 1 GB.
- Educators cannot download the data in excel format.

FUTURE ENHANCEMENTS

- Integrate Google spreadsheets to introduce useful Google features and to facilitate downloading data as excel sheets.
- Incorporate location services for planning meetings and events.

ACKNOWLEDGEMENTS

- Dr. Yu Meng: coached the project.
- Dr. Sophie Zou: contributed to brainstorming and suggestions for improvement during app development.
- Ms. Hixson: Rice Middle School Band Director who gave instructions for the band recruiting process

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APPENDIX

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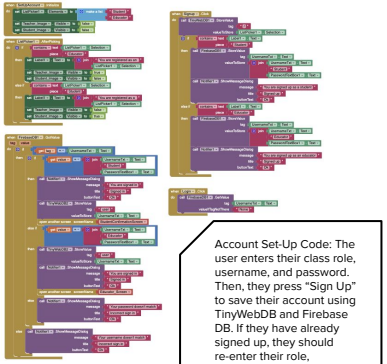
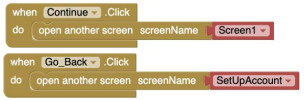
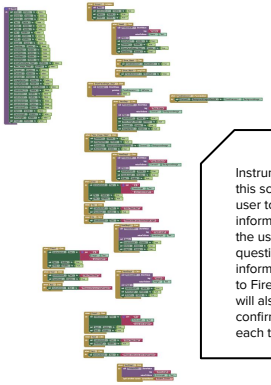
APPENDIX: CODE IMPLEMENTATION



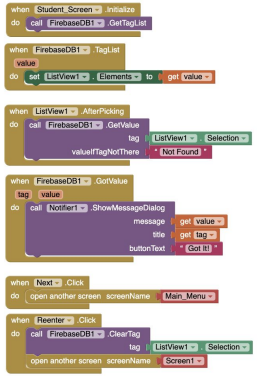
Account Set-Up Code: The user enters their class role, username, and password. Then, they press "Sign Up" to save their account using TinyWebDB and Firebase DB. If they have already signed up, they should re-enter their role, username, and password, and press "Log In" for the databases to validate user entry into the online classroom.



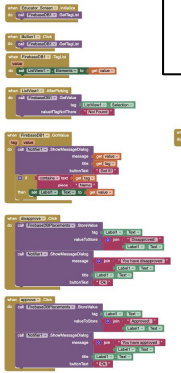
Student Confirmation Code: If the user presses "Continue", they've confirmed their user status and will be redirected to another screen to complete an instrument compatibility survey. If they press "Go Back", they will be sent back to the past screen to change their role.



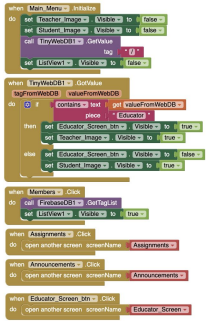
Instrument Survey Code: this screen requests the user to enter some information; everytime the user answers a question, their information will be saved to Firebase DB. Users will also be asked to confirm their answers each time they enter.



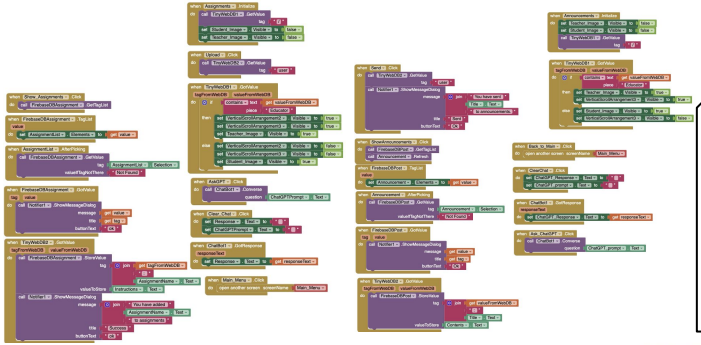
Student Screen Code: Students are displayed their information, taken from FireBase DB, and have two choices: press "Re-Enter" and go back to re-enter their information, or press "Continue" to go to the main menu.



Educator Screen Code: Instructors are displayed their students' information for them to decide whether or not they are suitable for band instruments; they can use two buttons to approve or disapprove them; their decision will be saved to another Firebase DB. If they are done, they can press "Main Menu" to go to the main menu.



Main Menu Code: Accesses TinyWebDB to recognize users as either educators or students; if the user is an educator, they will be shown the "Educator Screen", "Members", "Assignments", and "Assignments" buttons to navigate between screens and data displays; if the user is a student, they will be shown the same options except the "Educator Screen" button. Also, if the user presses "Members", instead of being redirected to another screen, the app will use FireBase DB to display a list of members' usernames.



Assignments/Announcements Code: These codes use TinyWebDB to recognize teachers and students. If the user is a teacher, they can post, view previous assignments/announcements(using a FireBase DB), and use Chat GPT(provided with the ChatBot component) to assist them in typing. If they are a student, they can only view assignments/announcements, and post announcements.