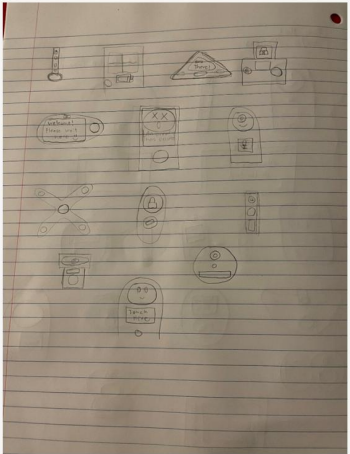Ben Hare

Edge Case UI Assignment
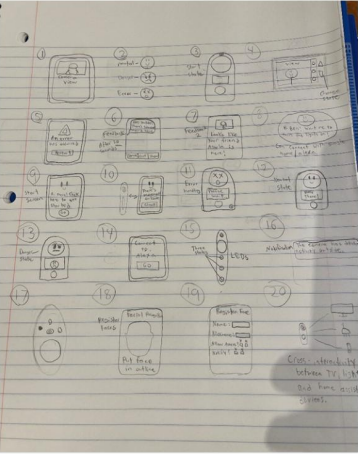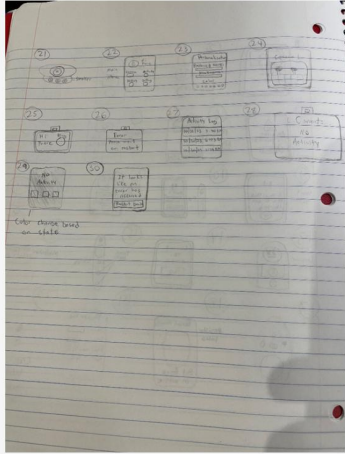
Sketches Round 1

30/10 Sketches 1

30/10 Sketches 2

After the 30/10 sketches, the members of my peer review group liked the idea of using an LED screen with a face to signify changes of state to the user. They also suggested possible ideas of incorporating cross device interactivity, which I was having trouble thinking of. After this round, I knew the direction that I wanted the design of my device to head in.
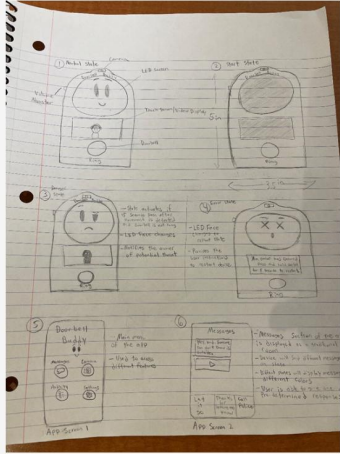
Sketches Round 2

Refined Sketches 1

Refined Sketches 2

Refined Sketches 3
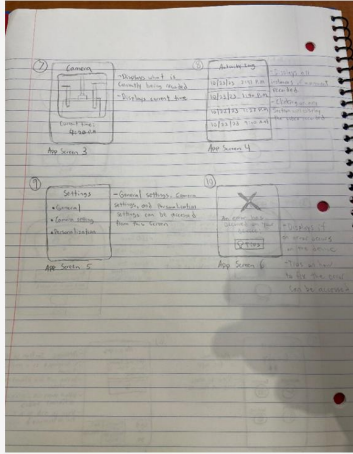
Refined Sketches 4

After round 2 of sketches, I knew what I wanted the general design of my device to be and focused on brainstorming and sketching out possible functions that the device could have, giving equal attention to both the physical device and the mobile app. My peer review group for these sketches liked the design of the device, but raised possible security concerns, especially with the "error state" being displayed directly on the device. For my final design, I wanted to focus more heavily on security.

Device States (left column)

Start State

Neutral State 1

Welcome home, Ben!
Would you like to turn on
the lights?

Yes   No

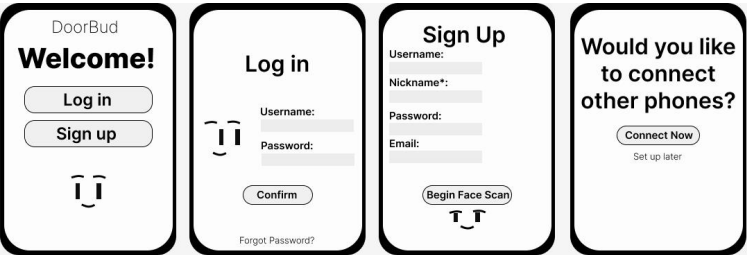**Neutral State 2**

Danger State

Content Notes

The physical device 5 inches by 3.5 inches and can be installed directly on the door. It contains a circular LED screen, which is used to display the face and different states of the device. Below is a touch screen that is used to display what is being recorded by the camera or ask if the user wants to turn the lights on. On top of the device is the camera itself. On the bottom is the button that is pressed to activate the doorbell, which has a sensor in it to indicate when it is pressed. On the side of the device is a potentiometer used to adjust the volume of the voice.

In the Start State, both the LED and the touch screen are blank if it does not detect a person outside, but the camera is continuously scanning.

When the camera detects a person outside, the LED screen turns on and plays a "waking up" animation. The face uses text-to-speech to greet the person outside and displays what the camera is currently recording. If the doorbell is pressed, it will tell the person to wait for the owner to answer the door.

The camera on the device uses facial recognition. The owner can register their name and face into the app, and if the device is connected to a smart device that controls the lights, it will ask the user if they want to turn the lights on when they approach the door. More names and faces can be registered in the app through settings if the owner wants to register family or friends. However, only the owner can control the lights.

The device uses an if-then statement to enter Danger State. When the device detects a person in front of the door, a 15 second timer will start. If the person outside does not ring the doorbell during this 15 second timer, the device will enter Danger State, and the face and color of the LED screen will change to reflect this. If the device enters this state, it will notify the user of the potential threat and show them the video of the person outside.

App Setup Screens (top right)

App Setup Screen 1

DoorBud
Welcome!
Log in
Sign up

App Setup Screen 2

Log in
Username:
Password:
Confirm
Forgot Password?

App Setup Screen 3

Sign Up
Username:
Nickname*:
Password:
Email:
Begin Face Scan

App Setup Screen 4

Would you like to connect other phones?
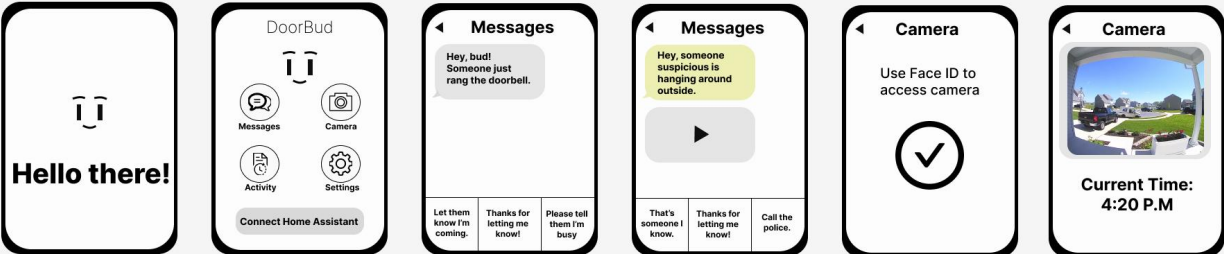Connect Now
Set up later

Content Notes

When the app is started up for the first time, the user is given the option to log in if they created an account in the past or sign up for an account.

The Log In screen asks the user for their username and password, and allows them to change their password by providing their email.

The Sign Up screen asks the user to come up with a username and password for future sign ins, as well as an optional box for a nickname that you would like your DoorBud to refer to you as and an email that can be used to notify users of potential updates or sales. Emails can also be used to receive doorbell notifications if the user's phone dies.

When a user signs up, they are required to perform a face scan to use the DoorBud's face recognition functionality and will be viewed by the system as the owner of the device, allowing them to connect and use other devices, such as Amazon Alexa or Google Home. The screen for the face scan can be seen in **App Face Scan Screen**.

At the end of the sign-up process, it will ask the user if it wants to connect other phones to the device in order to give ownership functionality to other members of your family or close friends. This can also be done from Settings.
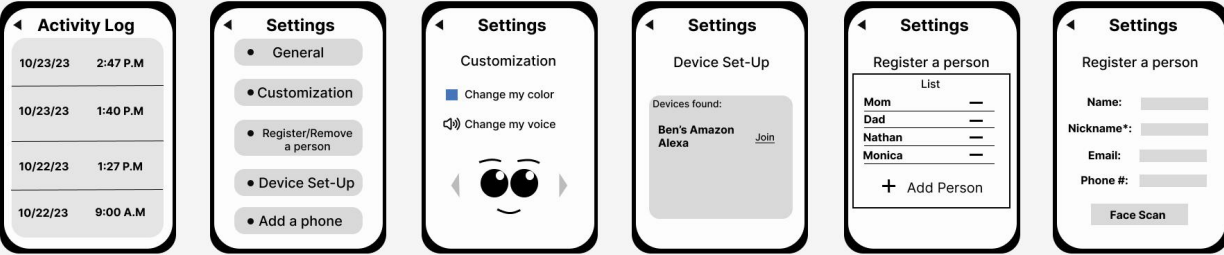
App Screens (bottom right)

App Startup Screen

Hello there!

App Main Menu

DoorBud
Messages   Camera
Activity   Settings
Connect Home Assistant

App Messages Screen 1

◄ **Messages**
Hey, bud!
Someone just rang the doorbell.

Let them know I'm coming. | Thanks for letting me know! | Please tell them I'm busy

App Messages Screen 2

◄ **Messages**
Hey, someone suspicious is hanging around outside.

▶

That's someone I know. | Thanks for letting me know! | Call the police.

App Camera Screen 1

◄ **Camera**
Use Face ID to access camera
✓

App Camera Screen 2

◄ **Camera**
**Current Time:
4:20 P.M**

App Activity Log Screen

◄ **Activity Log**
10/23/23   2:47 P.M
10/23/23   1:40 P.M
10/22/23   1:27 P.M
10/22/23   9:00 A.M

App Settings Screen

◄ **Settings**
• General
• Customization
• Register/Remove a person
• Device Set-Up
• Add a phone

App Personalization Screen

◄ **Settings**
Customization
■ Change my color
◁)) Change my voice
◄ 👀 ►

App Device Set-Up Screen

◄ **Settings**
Device Set-Up
Devices found:
Ben's Amazon Alexa   Join

App Register a Person Screen 1

◄ **Settings**
Register a person
List
Mom —
Dad —
Nathan —
Monica —
＋ Add Person

App Register a Person Screen 2

◄ **Settings**
Register a person
Name:
Nickname*:
Email:
Phone #:
Face Scan

App Face Scan Screen

◄ **Settings**
Register a person
Fit face in outline
Scan

App Error Screen

An error has occured on your device! Reset the device by holding down the doorbell for five seconds
More info

Content Notes

When the app starts up, a short animation plays where the face appears and greets the user.

The main menu of the app contains 5 different options that the user can choose from. Clicking on any of the buttons will fade the screen out and bring the user to the next screen.

The Messages screen is displayed in the style of a text message and functions as the device's notification center. When movement is detected and the doorbell is pressed, it will notify the user. The user is able to choose from one of three pre-selected options, which will perform different functions. The options and color of the message will change to reflect different states.

The Camera screen will use either face ID or a password set by the user to confirm their identity. Then, the screen will display what is currently being recorded by the camera, as well as the current time.

The Activity Log screen will display the history of times that movement was detected outside. Clicking on any of the boxes will bring up a clip of the video that was recorded at that time.

The Settings screen gives the user 4 options to choose from. "General" allows the user to change basic settings like time zone, camera resolution, and notifications. "Customization" allows the user to change the color of the screen, the voice of the device, and the display of the face. "Register a person" allows the user to register people they know into the device so that the device will recognize them and greet them by their name. This screen will ask for the person's name, an optional nickname, their email, and a face scan to use the facial recognition. People are able to be removed from the list by pressing the minus button to the right of the name. "Device set-up" allows the user to connect to other smart home devices, such as home assistant devices or other security cameras via Bluetooth. "Add a phone" allows the user to provide access of their account to other users, allowing other people to access the app and make use of cross-interactivity.

The Error screen will only occur if an error is detected within the device itself. It will advise the user to manually reset the device and extra info about the error can be provided if resetting the device does not fix it.
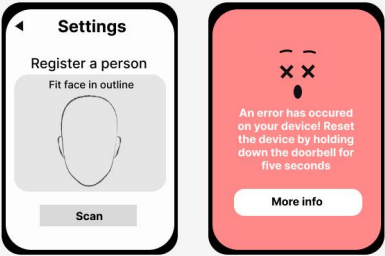
Edge Cases:

Devices connected to the doorbell camera, such as Alexa, can be hacked which would leave the doorbell camera vulnerable. This can be addressed by allowing the connected devices to be easily disconnected.

Using only one camera on the device could lead to people finding ways around being spotted. This issue is addressed by allowing users to connect their device to different security cameras around their house. They are able to change the view from the Camera screen on the app.

If the user's phone dies while out, they will not be able to receive any notifications of movement at their door. This can be addressed by allowing for different forms of communication, such as through email.

Settings

Device Set-Up

Devices found:

Ben's Amazon Alexa   Join
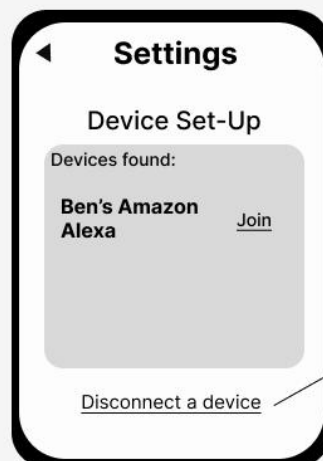
Disconnect a device

Disconnect button

Edge Case 1

Camera

◀Switch Cameras▶

Current Time: 4:20 P.M

Arrows used to switch cameras

Edge Case 2

Content Notes:

A disconnect button is displayed at the bottom of the Device Set-Up screen. When hit, it will display the devices currently connected and confirm if you want to disconnect any of them.

Content Notes:

When multiple security cameras are connected to the DoorBud, the option to switch between different cameras will appear underneath the camera footage on the Camera screen.

Sign Up

Username:

Nickname*:

Password:

Email:

☐ Receive notifications through email

(Begin Face Scan)

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Checkbox to receive notifications through email

Edge Case 3

Content Notes:

On the original Sign Up screen, there will be a checkbox that users can click if they want to be notified through their email, as well as through the app itself. This provides the user with other methods of checking their camera even if their phone dies.