iMado – An IoT window blind controller

Project Description

iMado provides an IoT service that allows users to control their window blind and, thereby, room light. The user can set auto-open/close times, initiate open/close through a phone app, or voice-control the window blind using Amazon Alexa.

Users

Our users are people who live in rooms with window blinds. They may want morning light to help wake them up, need all blinds closed whenever they leave the room, or want to be able to close the blinds in the morning for better sleep quality on a Sunday.

Required Hardware

- Particle Photon (with breadboard, wires, LEDs, etc)
- PARALLAX Continuous Rotation Servo Motor
- Amazon Echo Dot

Required Services

- Particle Web IDE
- Alexa Voice Service
- Google Firebase
- Particle.io

User Stories

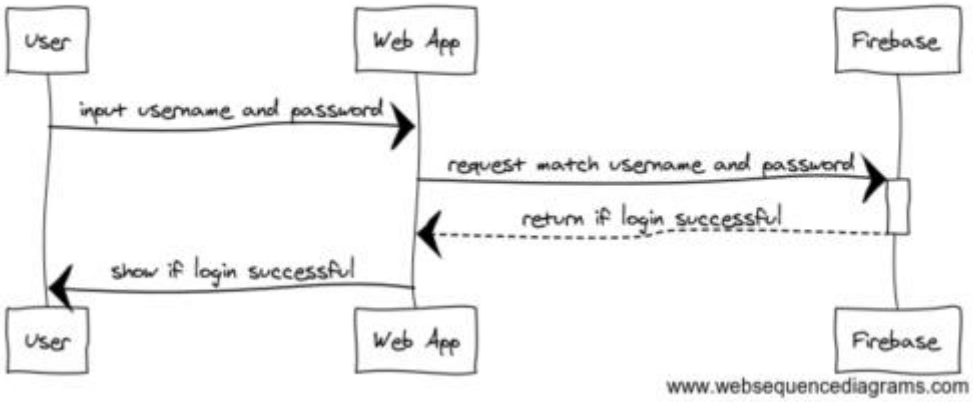
1. As a user, I can log in to my phone app so that I can view and control my window
2. As a user, I can set an auto-open/close time, when the window blinds will automatically close if they're open, and open if they're closed, so that I can control the level of natural light in my room
3. As a user, I can open/close the blinds using the phone app so that I can remote-control the window blinds
4. As a user, I can see the current status of the window blind using my phone app so that I can know whether my privacy is protected and whether the blinds are in my desired status

5. As a user, I can open/close the window blind by talking to my Amazon Echo Dot so that I can control room light in bed without having to reach for my phone

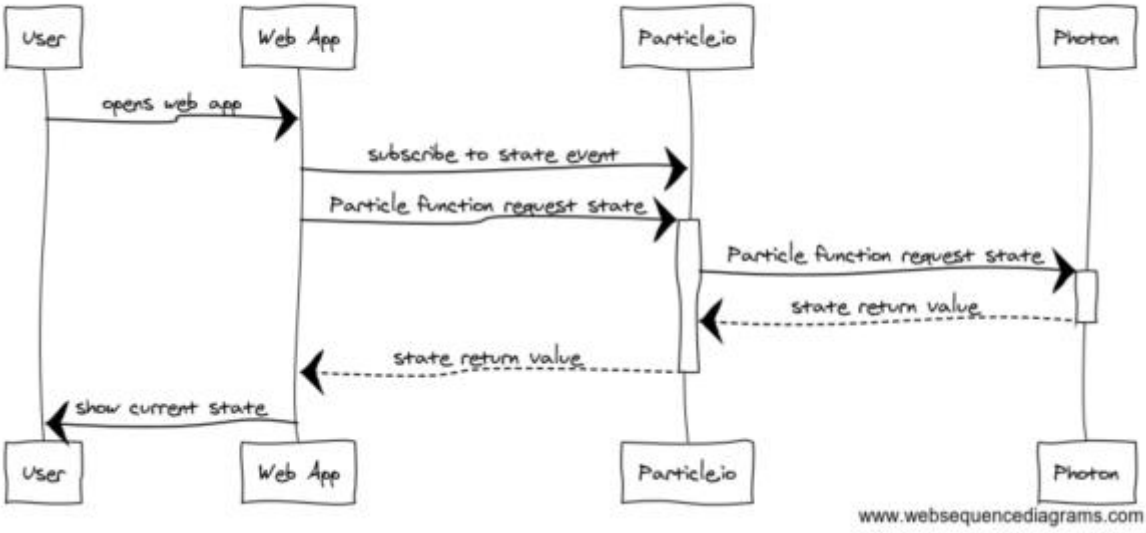
Usage Scenarios

1. Log In
    a. The user opens the iMado app on his/her phone.
    b. The user inputs his/her username and password.
    c. The user sees the main screen of the phone app.
2. Auto Open/Close
    a. The user opens the iMado app on his/her phone.
    b. The user presses the Auto Open/Close tab.
    c. The user inputs an auto-close/open time.
    d. The user presses the button to submit the new time.
    e. The blinds automatically open/close at the specified time.
3. Phone Open/Close
    a. The user opens the iMado app on his/her phone.
    b. The user presses the Up-Close / Down-Close / Open buttons to close/open the blinds.
    c. The blinds are moved to the desired status.
4. Current Status
    a. The user opens the iMado app on his/her phone.
    b. The app displays a special pattern on the buttons to indicate the status of the blinds.
5. Alexa Integration
    a. The user says “Alexa, open/up close/down close Particle blinds” in a location where Amazon Echo Dot can hear the user.
    b. The blinds open/close immediately.
    c. Alexa provides with the user feedback about current status of the blinds.

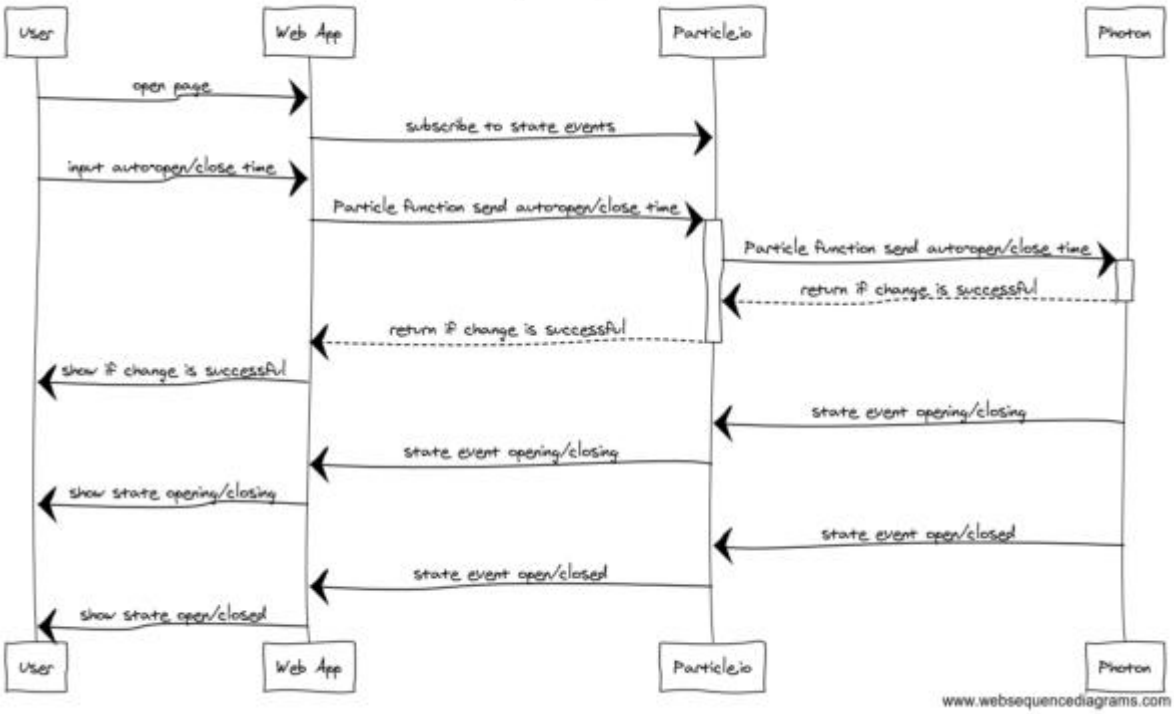
Usage Login



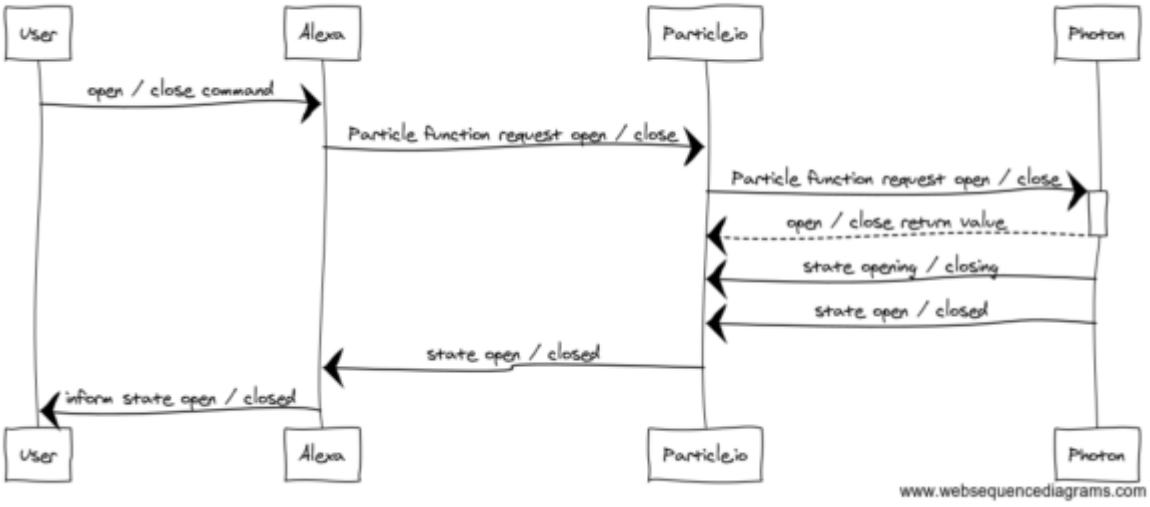
Usage Open Web App

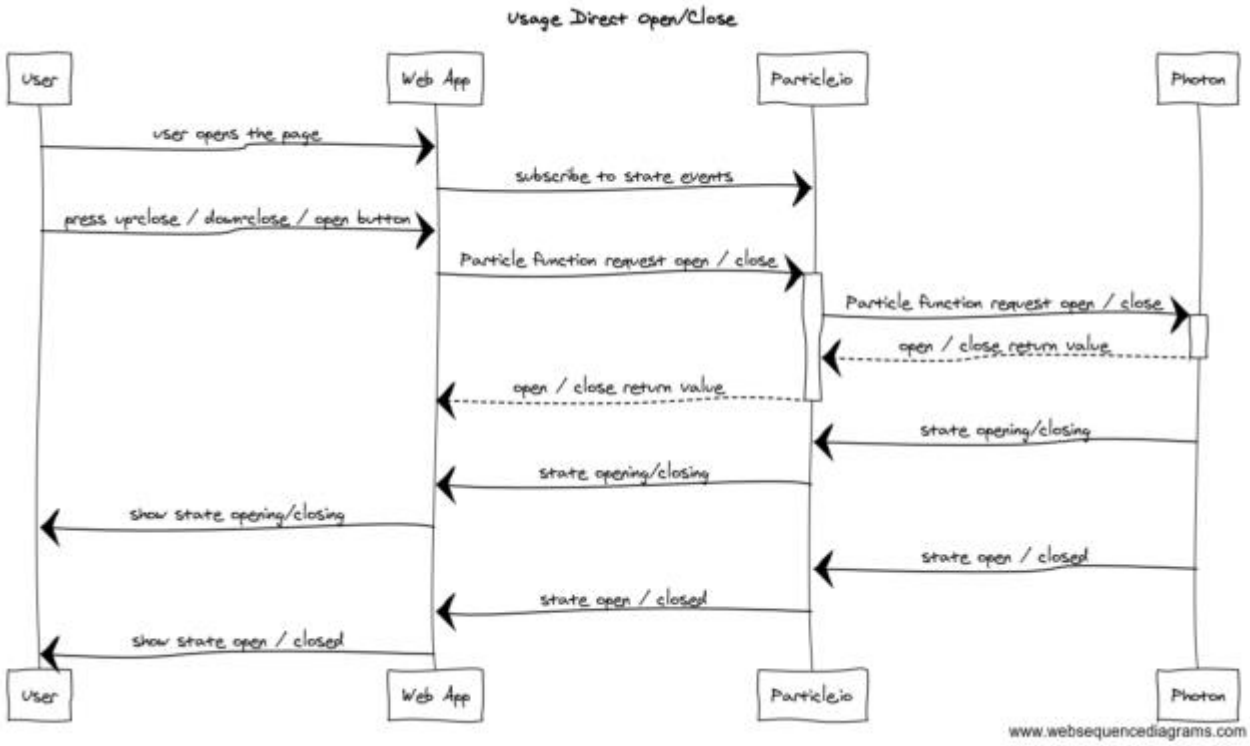


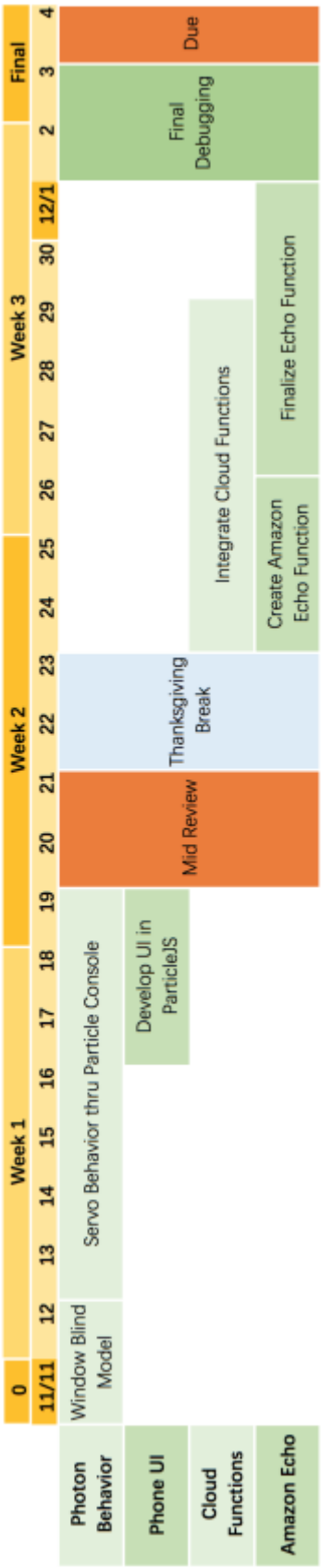
Usage Autoopen/Close



Usage Alexa Direct open/Close




Usage Direct open/Close
User
Web App
Particle.io
Photon
user opens the page
subscribe to state events
press upclose / downclose / open button
Particle function request open / close
Particle function request open / close
open / close return value
open / close return value
state opening/closing
state opening/closing
show state opening/closing
state open / closed
state open / closed
show state open / closed
User
Web App
Particle.io
Photon
www.websequencediagrams.com



Cheng

- Order new continuous rotation servos
- Lead servo behavior development during Nov 11-18
- Take on 50% of cloud function implementation work, complete by Nov 28
- Contribute to UI development, and Amazon Echo integration and testing
- Contribute to final debugging

Yihan

- Lead UI development
- Lead Amazon Echo integration and testing using Echo dot
- Take on 50% of cloud function implementation work, complete by Nov 28
- Contribute to servo behavior development
- Contribute to final debugging