IOT Team 7

Balance

Overview: This ambient device, a smart old-fashioned weight scale, gives you an indication of the status of your work/life balance. This visual representation gives the user a subtle nudge to live a happy, healthy life where there is a balance between work and play.

Problem: Most of us intend to keep a balance between the number of hours we spend doing work and the hours we spend on self-care or socializing. However, the perfect balance is hard to manage. Spending more time working can lead to stress, dissatisfaction and lower level of creativity and energy. On the other hand, spending too much time enjoying life might lead to...well, too much work piled up or worse, failure.

Design Decision: We wanted to create an ambient device using objects that we already associate with the idea of balance. Weight scale was a perfect choice. The scale will not grab your attention by sending any alerts or messages. It will stay in the background informing you of your work life balance. It will not be apparent to a stranger what the device does, thus keeping your life and data private. These are some of the features that makes the scale an ambient device.

Output and workflow: The balance arm changes its position by connecting a servo motor to the pivot. The system tracks your phone location data and logs how long we are on campus and off campus. If you spend more than 8.5 hour/day on campus, then the servo rotates the scale to make the “Work” side seam heavier. If you are spending less than 7.5 hours/day on campus, the servo motor rotates the scale to make the “Life” side seem heavier. An ideal situation would be for the scale to be completely horizontal. This shows that you have achieved work/life balance.

Workflow

1. IFTTT app tracks users’ location and logs it using the GPS of your phone.
    a. When user enters the radius, a timestamp is added to a Google sheet row.
    b. When user exits the radius, a timestamp is added to a Google sheet row.

    c. A Google sheet formula calculates the difference in hours of the enter/exit timestamps.
    d. A Google sheet formula adds up the hour differences in the day in a cell labeled “Total Daily Work Hours”.
2. IFTTT app triggers an event every weekday at 3:00am.
    a. When the event is triggered, the Particle Photo uses a webhook to read the value in the “Total Daily Work Hours” cell.
3. IFTTT app triggers an event every day at 3:05am.
    a. When the event is triggered, a Google App script deletes the timestamps in the Google sheet. This is done so that the Particle Photon reads fresh data every day and allows for complete automation of the IoT device.
4. After the webhook reads the daily work hours value, it performs an action based on the value.
    a. If the value is greater than 8.5, it rotates the servo motor 2 degrees clockwise (work)
    b. If the value is less than 7.5, it rotates the servo motor 2 degrees counterclockwise (life)
    c. If the value is between 7.5 and 8.5, the servo motor rotates 2 degrees closer to the balance point.

You only get one data point per day, so it will take a long time to tip the scale either way, but it will give you effective feedback. If it tips too much in one direction, then you know that you should change your routine.

Bill of Materials:

1. Breadboard
2. Photon
3. Servo motor
4. wires
5. Foamcore
6. Strings