

## 2f Posture Design Check-In

Originally we had different use cases as our “tasks,” but we found that our actual tasks were 1) trying to have better posture and 2) avoiding bad posture. We broke those two main “tasks” into a few subtasks, and have kept our original list of use cases for reference.

### **Posture Tasks + Subtasks:**

1. Trying to look confident with good posture (use case 1)
2. Avoiding back pain/stiffness when sitting (use case 3,6,7)
3. Trying to become aware of daily “posture creep”
4. Correct the misunderstanding toward “good posture”
5. Discovering which activities trigger posture habits to form
6. Need to get close to the monitor to get focus on contents of the laptop (While using a laptop, avoid leaning in too closely see contents of laptop)
7. Adapting to different activities (using cell phone standing vs. using desktop seated)
8. Prevent interference with critical tasks

### **Use Cases:**

1. Discussing work with client in a meeting (maintaining posture completely secondary) (task requiring full attention to primary task)

Amy is a project manager at a consulting firm in Seattle. She recently graduated college, and joined the company a few months ago. Her first client project has hit a major problem, and now she needs to bring it up to the client. Although Amy has prepared well for the meeting, she knows it will be a difficult discussion and wants to be sure she can be paying complete attention to what is going on in the room. She has been working on developing good posture, but at this moment, she really doesn't care much about that. Her primary goal for the day is just getting through this day.

2. Taking a difficult test in a lecture hall (maintaining posture secondary, primary task is important to focus but not absolutely critical)

Peter, rushes into Kane Hall with two minutes until his Chem 142 final is supposed to start. He was up far too late the night before, and with only a few hours of sleep, he managed to sleep through all five of his alarms. He has been working on developing better posture, and he tries to sit up straight, hoping in vain that it will wake him up and help him focus. As he skips question after question, his posture begins to slouch as he becomes disheartened. His focus slips from sitting up straight to retrieving the information he spent all night attempting to memorize.

3. Comfortably studying at a desk in the library for several hours (posture secondary, but primary task isn't critical)

Tom is a college student and like to spend several hours in the library to deal with assignments of lectures. He downloads the slides from the past week, scans them for key vocabulary words, and records them in a personal dictionary for each class. His computer is old and runs slowly when he has multiple programs open, so reviewing each lecture takes longer than it should. He

enjoys studying, but is often distracted by funny cat videos on the internet. Sometimes this causes Tom to lose track of time and he spends hours at the same desk in the library. Also he stands up and go for a walk at regular intervals for refresh to keep the concentration.

4. Maintaining good posture while driving your car to work in the morning (mix of both primary and secondary, switching off as driver's attention is focused on road)

Casey rushes out of the door of her house, checking the time on her phone. She has to be to UW by 2:30 for her class, and she's running a little late. She's juggling her car keys, a mug of coffee, and her bag. She hops in her sedan, and carefully pulls out of the driveway. She turns on the radio, and takes her typical route to I-5. Her attention is drawn to the line of traffic backed up onto the on-ramp. As she sits in traffic, she adjusts her seat to help her sit in better posture. Casey has recently started yoga, and has been working on developing her back muscles. A car swerves into her lane, and she hits her breaks and puts both hands back on the wheel. Crisis averted, she finishes adjusting the seat, and continues her slow commute to work.

5. Having good posture while using a smartphone (texting, typing, browsing, watching video)

Brian gets a text from his friend Carl while waiting for the bus and picks up his phone to read it. To get a clearer view, he stretches his neck out and looks down, and stays in that position while responding. He then scrolls through Facebook and watches a video until his bus shows up. After getting onto the bus, he looks back down at his phone and watches Youtube videos.

6. Can concentrate on laptop work without being conscious to keep good posture or distracted. Reducing distracting back pain while responding to emails at work.

Sally is a researcher and spend a lot of time in front of Laptop doing programming and dealing with emails. She keeps in almost the same posture for a long time but sometimes stretches herself to take the stiffness out of her shoulders. The pain makes her unable to concentrate on her work. She attributes the pain to the posture which hunching over while doing desk work. After the stretch, she corrects her posture but after a while, she forgets to do it and return to the same posture she is used to be. Her friends recommend her an application remind her to correct the posture but she is distracted every time notification shows on smartphone.

7. Running and walking on a treadmill.

Bob is a college student who has started running on the treadmill regularly. In the past he has hurt his knees so he tries to maintain good form as he runs. If he runs for more than 30 minutes, he starts to feel pain and tightness in his lower back. He's spent a lot of time learning about different exercises that are easy on his knees. He's trying to lose five pounds but often feels discouraged about how painful his body feels after a run.

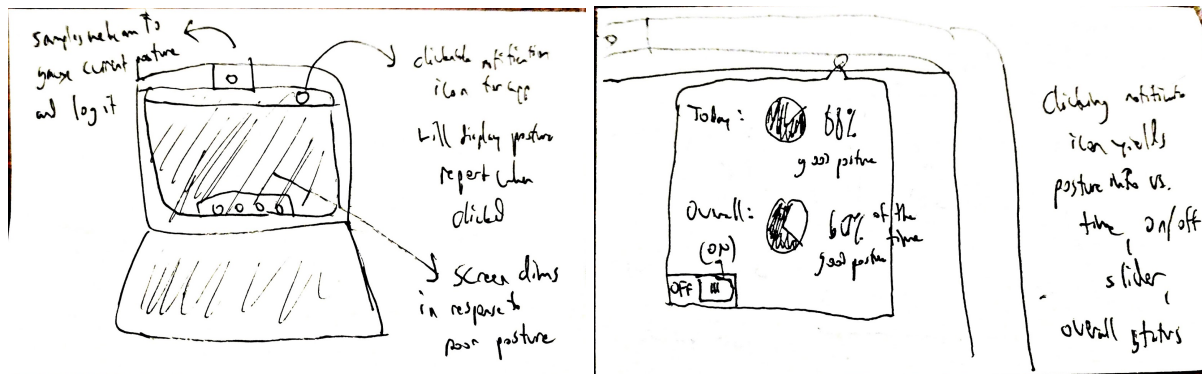
## Initial Designs

### Design 1: Laptop Webcam App

#### High-level Description

While sitting in front of your laptop, the app will run and poll your webcam to determine your posture. If you currently have bad posture, the app will notify you by dimming your screen a customizable amount until you sit up. Posture status and times will be logged by the app for later review.

#### Sketches



#### Supported Tasks:

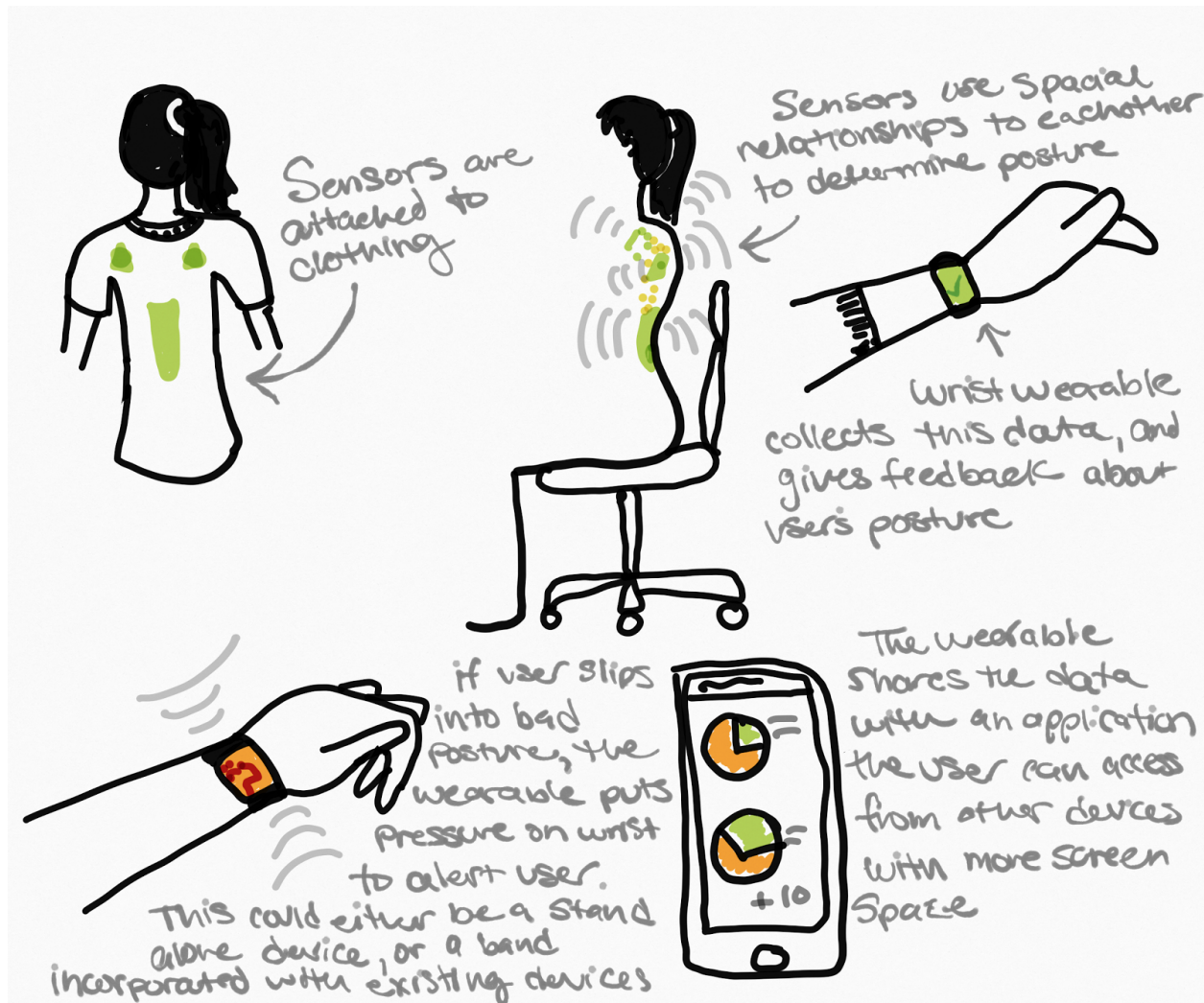
- Task 1: **Trying to look confident with good posture.** By reminding of posture when sitting in front of a laptop, you can show greater confidence.
- Task 2: **Avoiding back pain/stiffness when sitting.** By getting posture reminders when sitting in front of a laptop, you are more likely to adjust your position to sit up straighter.
- Task 3: **Trying to become aware of daily "posture creep".** Stop posture creep by notifying immediately when posture is slipping, so it's corrected immediately
- Task 6: **Need to get close to the monitor to get focus on contents of the laptop.** The app will detect when you are leaning towards the screen and darken the screen in response to notify you of poor posture.
- Task 8: **Prevent interference with critical tasks.** Since the notification is done via dimming the screen, which is relatively non-invasive, work currently being done will not be interrupted.

### Design 2: Wearable

## High Level Description

This design includes sensors that attach to the user's clothes. These sensors monitor the posture of the user, and communicate it to the wearable device located on the user's wrist. If the user has good posture, the wearable provides positive, passive feedback. When the sensors detect that the user's posture has deviated a certain amount from what is considered acceptable, the device puts pressure on the wrist, lightly squeezing. The wearable also could connect with an application, accessible either by mobile or on desktop. Here, users can access visualizations about how their posture has been over time, and whether it has improved.

## Sketches



## Supported Tasks:

- **Task 1: Trying to look confident with good posture.** By reminding of posture such as before presentation, you can be aware of being good posture

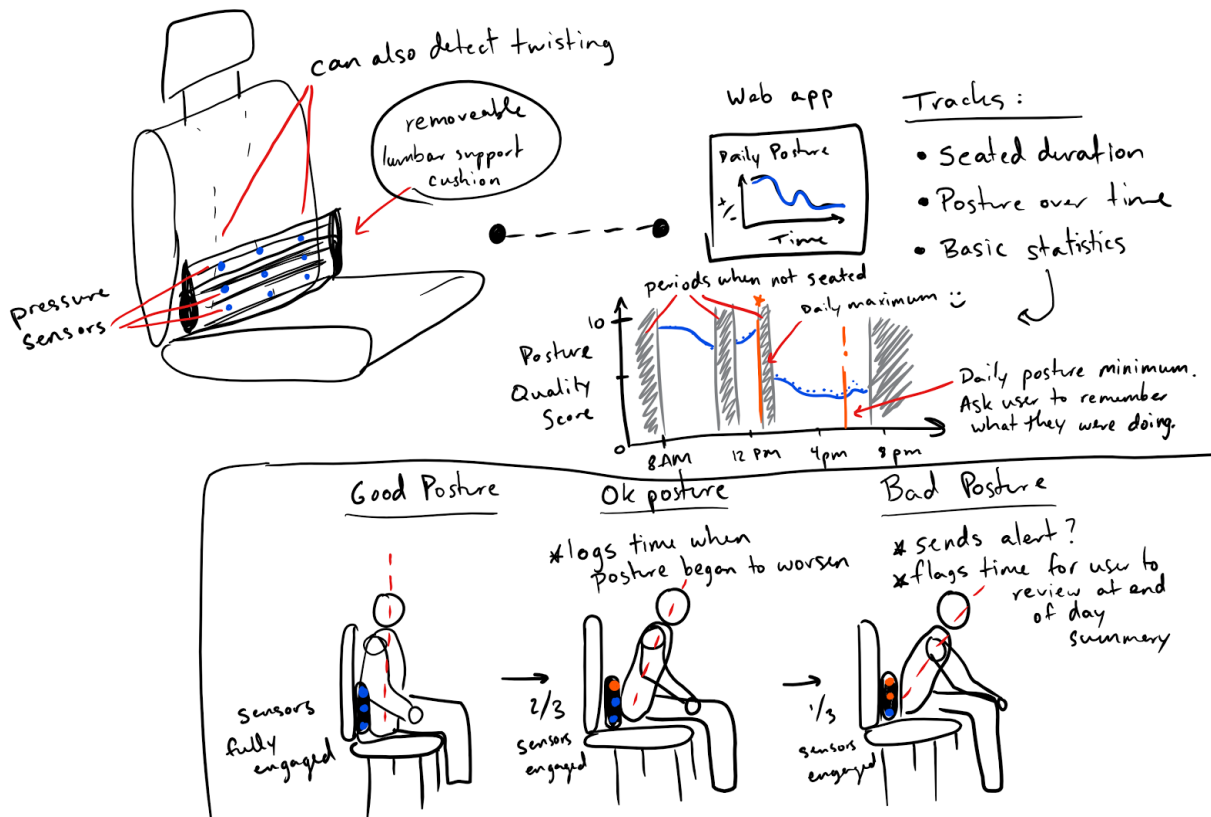
- Task 2: **Avoiding back pain/stiffness when sitting.** By reminding unchanged (bad) posture during desk work, people can avoid back pain/stiffness of back and shoulder
- Task 3: **Trying to become aware of daily “posture creep”.** By recording the posture using the sensor, user can see the changes of the posture as time passes
- Task 7: **Adapting to different activities.** User can use this device in any situation because the device is designed to be wearable.

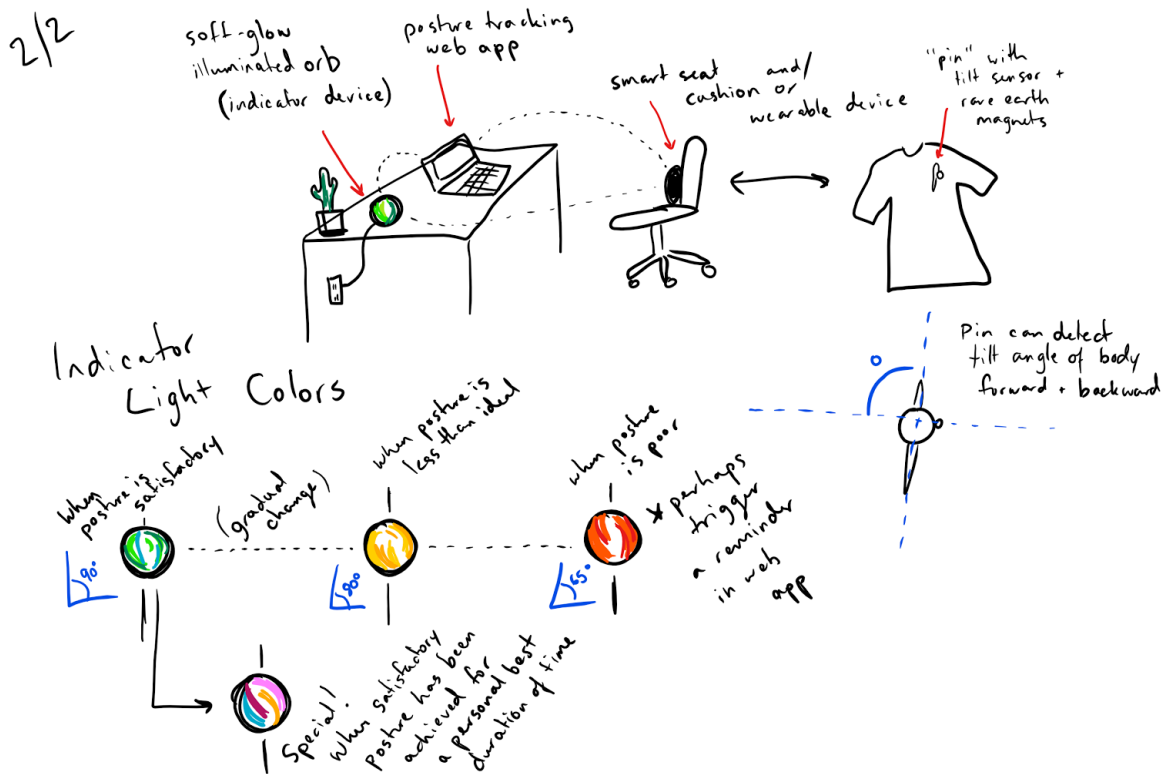
## Design 3: Posture Light

### High-level Description

Some combination of a “smart” lumbar support cushion, tilt-sensitive wearable device, and indicator device will provide real-time feedback about posture. The lumbar support cushion will be embedded with sensors that can estimate a person’s upper body tilt angle, which has a large overall effect on bodily posture. This angle will be logged over time as a “posture score”, which can be reviewed at any time in an online web app. The web app will also flag the daily best and daily worst posture score, and prompt for more information about what was happening during the day at that time. A bluetooth-connected indicator device can be connected that provides real-time feedback about posture in the form of gradiated colors of light. Colors will correspond to different quality levels of posture, and additional positive reinforcement can be provided in the form of special colors that activate during daily best posture scores and/or personal record durations of good posture. These devices will encourage good posture without interfering with daily tasks.

### Sketches





### Supported Tasks:

Task 1: **Trying to look confident with good posture.** Refer to the indicator device throughout the day to get feedback about current posture and corresponding body language.

Task 2: **Avoiding back pain/stiffness when sitting.** Using the positive reinforcement features of the web app, try to set personal best records for good posture, which will strengthen back muscles that contribute to stiffness.

Task 3: **Trying to become aware of daily "posture creep".** Use the indicator light as a reminder to maintain good posture.

Task 5: **Discovering which activities trigger posture habits to form.** Rather than logging posture quality throughout the day, use the web log to identify dramatic posture changes that happen and think back to what might've caused them.