

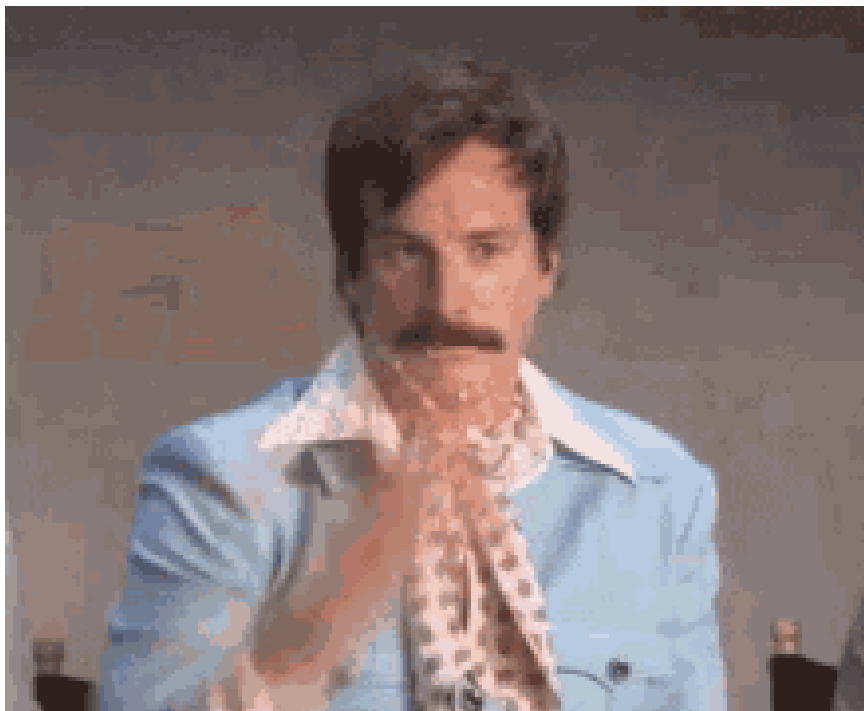
Step 1: Microcontroller to Human

(9/2) Design Journal Entry 1 – Installation and First Challenges (In-Class)

When I first plugged in my ESP32, I couldn't see the board showing up in the compiler. I tried several troubleshooting methods, including downloading the Mac-specific driver and adjusting some of the connection settings, but nothing seemed to work. This feels frustrating and makes me question whether I have the baseline knowledge to complete Step 1.

I have a lot of experience working with the Raspberry Pi and CircuitPython, but not as much with Arduinos. Sometimes I worry about my lack of formal education in computer science and that my "gaps in knowledge" will show up in the quality of my work. These insecurities definitely came up during this step.

I started this step in class. I am extremely grateful for Alistair, who was kind, understanding and helped me troubleshoot. He was having trouble as well. We eventually figured out that the problem was connectivity, not the board itself. Having someone to work through the issue with felt reassuring and made the process less intimidating.



(9/3) Design Journal Entry 2 – Baud Rate and Data Types (At-Home)

I was able to get the board connected, but I am still having problems with error messages in the compiler. Ugh.



(9/4) Design Journal Entry 3 – Baud Rate and Data Types (In-class)

Back in class. I showed Alistair the error message I was getting at home. He suggested changing the baud rate. Although this didn't solve the issue, it gave me a better sense of how communication timing matters. It also helped me orient myself within Arduino's compiler. Next, he shared a couple of lines of code from the professor that helped in completing the setup. Finally, it works. I want to practice everything again at home so I'm sure I understand.

Before I left class, I experimented with sending different data types through the serial monitor. I haven't tried arrays yet, but I understand they're a way to store and organize multiple pieces of data in one variable, which could be useful for more complex outputs later. I feel like there's never enough time. Ugh.

Step 2: Talking Board to Board

(9/4) Design Journal Entry 3 – Attempting Partner Serial Communication (In-class)

For Step 2, my partner was again Alistair. He had already gone through the exercise at home, so he was willing to double-check that my board was set up correctly. Unfortunately, I wasn't able to complete the full partner experiment in class because I had to meet with the professor about my project and then leave quickly to catch my train back to Sacramento.

I plan to run the experiment with a friend outside of class. This experience made me think about how my commute might affect my ability to collaborate with peers and do partner work outside of regular class hours. This is something I'll need to plan around as the course gets more complex.

(9/8) Design Journal Entry 4 – Thinking About Adding a Third Device (At-Home)

(Even though I haven't wired up the partner test yet, I thought about the prompt question: *What would be needed to add a third device?*)

Technically, it would require assigning each device a clear role in the network (sender, receiver, or possibly a relay). With only two devices, the communication is straightforward; one talks, the other listens. Adding a third device introduces more complexity, like managing who is "speaking" at what time so the signals don't clash.

I think it opens up some interesting possibilities. For example, three devices could form a mini-network where one sensor node collects environmental data (like sound), another node processes or transforms that data, and a third outputs it visually or sonically. I imagine applications in collaborative installations, where multiple microcontrollers "talk" to each other to produce something bigger than any one device could on its own.



Step 3: Listening to the World (Sensors)

(9/9) Design Journal Entry 5 – First Attempt with Sensors (In-Class)

For this step, we used the Adafruit APDS9960 and the MPU-6050 STEMMA sensors in our kits. Unfortunately, my laptop battery was running low that day, and there wasn't access to power at my table. We also had a guest speaker scheduled, so time was limited. Given these constraints, I didn't feel confident trying to set everything up alone. Instead, I followed along with my classmate Alistair. Even though I wasn't able to complete the full setup myself, observing the process with a partner was useful.

(9/9) Design Journal Entry 5 (cont.) – Observations and Limitations (In-class)

During testing, we noticed that the APDS9960 could detect directional movement (i.e., left, right, up, and down). At first, the readings weren't consistent, but we realized the sensor performed better when we stayed close to it. This highlighted how sensitive sensor-based communication can be to context, like distance and positioning. It also reminded me of the earlier discussions about “noise” in communication systems. In this case, physical distance acted as a kind of barrier to accuracy.

Unfortunately, we had to cut the exercise short to make room for the guest speaker. Still, this experience gave me a glimpse into how sensors can bring data from the physical world into a system, and how those readings could eventually be combined with other communication protocols for creative projects.



Step 4: Talking Over the Air (WiFi/OSC)

(9/10) Design Journal Entry 7 – Attempt at Step 4

I wasn't able to fully complete Step 4. I tried stopping by the makerspace when I first arrived on campus, but I didn't see any of my classmates there and wasn't sure how to approach the setup on my own. I went back later, but I had a previously scheduled appointment that limited my time. Because of this, I wasn't able to get my ESP32 connected to the router or move forward with the OSC test.

This felt like another moment where timing and commuting made it harder to engage with partner work. I'm realizing that I may need to plan ahead more intentionally to get the full benefit of these collaborative steps.

(9/10) Design Journal Entry 7 (cont.) – Observations and Next Steps

Although I couldn't run the full exercise myself, I stayed for a bit to observe a classmate troubleshooting their ESP32's connection to the makerspace router. It was interesting to see how small details (like network setup and IP address recognition) could stop the process from working smoothly. Watching their attempts gave me some insight into what challenges I might expect when I revisit this step. I'd like to return to this step with more time and a partner so I can get hands-on experience with wireless communication.

