Electronics Online Challenge

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Introduction:

I selected a Jelly Comb wireless 2.3 GHz mouse to deconstruct because many of us use a mouse every day to navigate the internet, join zoom meetings, and submit assignments, but we hardly think anything of it. The mouse allows us to insert ourselves into the computer and control what it does by just moving our wrists and clicking a few buttons. A wireless mouse, specifically, allows us to do all of this via the mouse and receiver in the computer communicating over a specific radio frequency. And the mouse does all of this by taking thousands of photos a second, analyzing those photos, and then determining the change in those photos in order to create an input for the computer to interpret. That is incredible to me, and the reason why I chose a wireless mouse for this challenge.

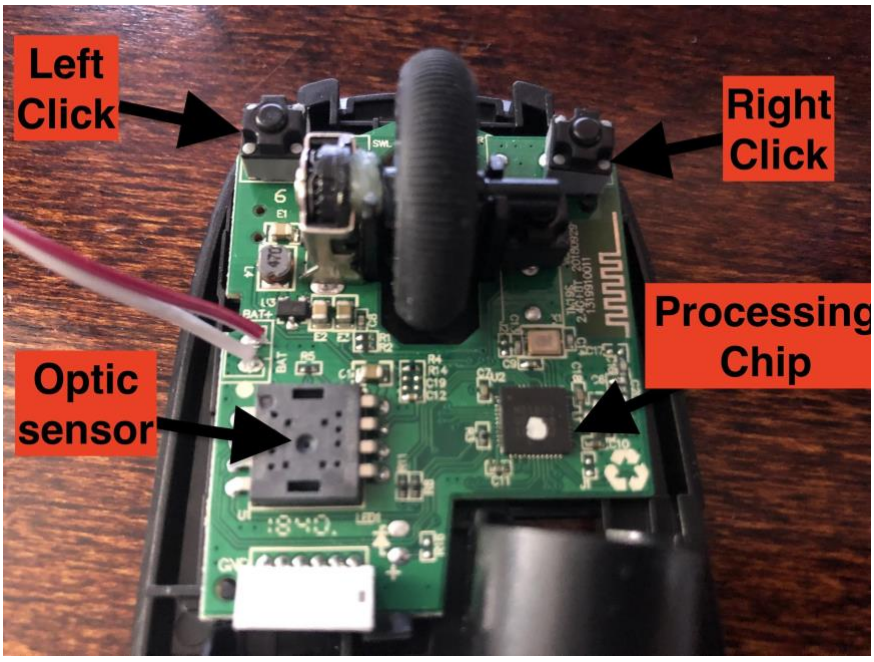
Components:

Inside the mouse there are several key components that allow it to do its job. Some of these include the optic sensor, the micro-processor, the scroll wheel encoder, and the binary buttons (left click, right click, side mouse buttons). These sensors are integral to the function of the mouse and its interaction with the computer. None of these components were made by Texas Instruments, in fact, most of the parts were not labeled. Some had the label “Huano” but that was all that I could find. The processing chip and the optic sensor are the most complicated pieces of hardware in the mouse. The optic sensor takes thousands of photos each second and then sends them to the processing chip to be analyzed and then created into an input for the computer to move the cursor, and all of this is happening incredibly fast. As I mentioned before, there are several binary buttons on the mouse. These are some of the most simple sensors, but being able to left click or change the DPI on the mouse is incredibly useful.

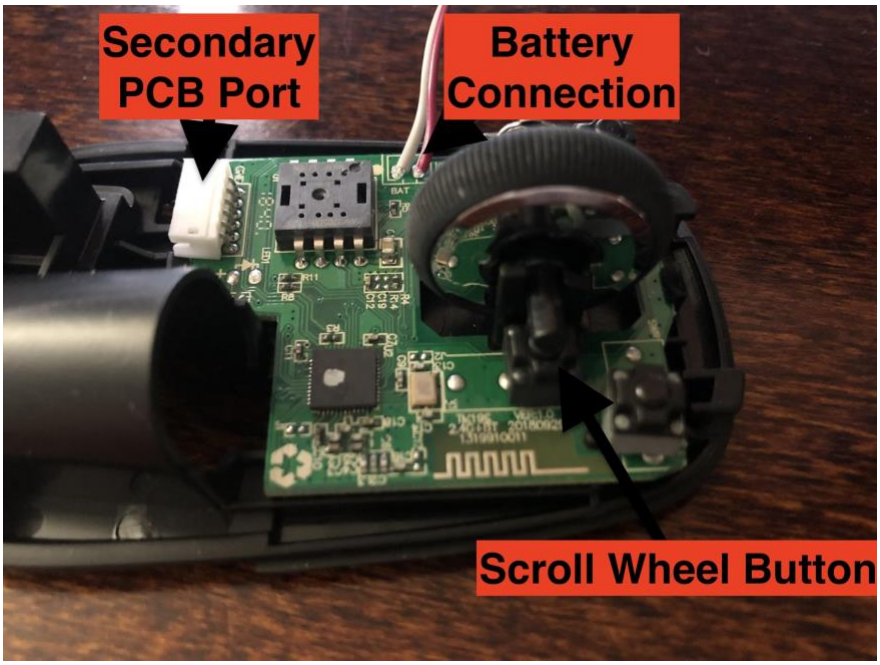
Side view of the mouse before deconstruction. It is a typical computer mouse. It can left click, right click, scroll, change DPI, and go forwards or backwards on a page. And it can of course move the cursor

Bottom view of the mouse before deconstruction. This view depicts the power switch, the blue tooth/USB button, and the optical sensor.

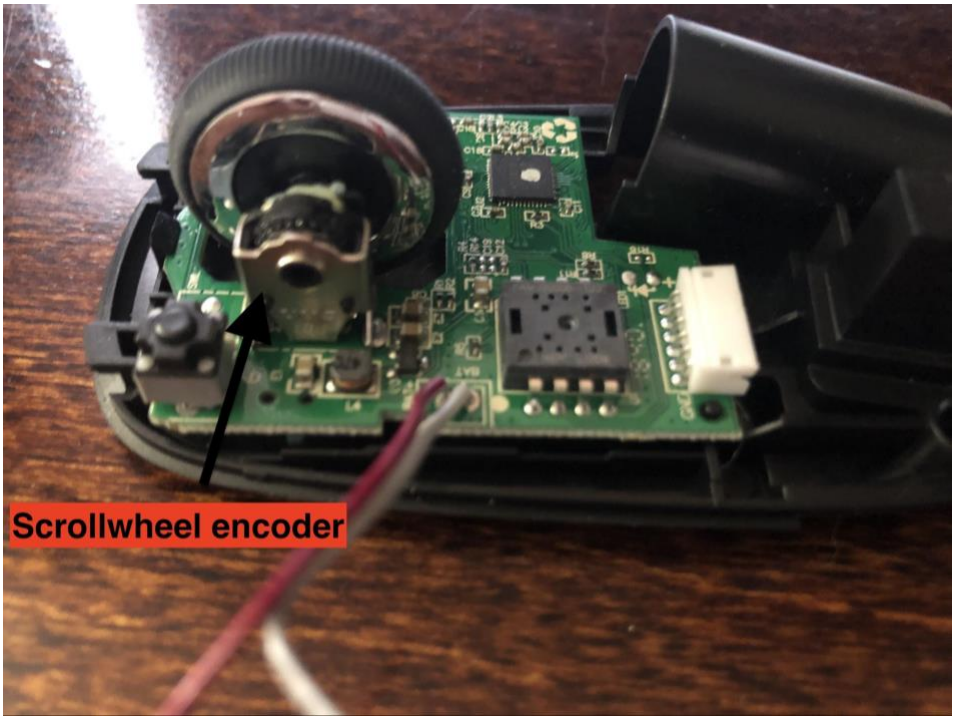
I started my project by simply removing the back casing to expose the battery housing and USB receiver housing. The next step in the deconstruction was to simply remove the two screws and take off the shell.



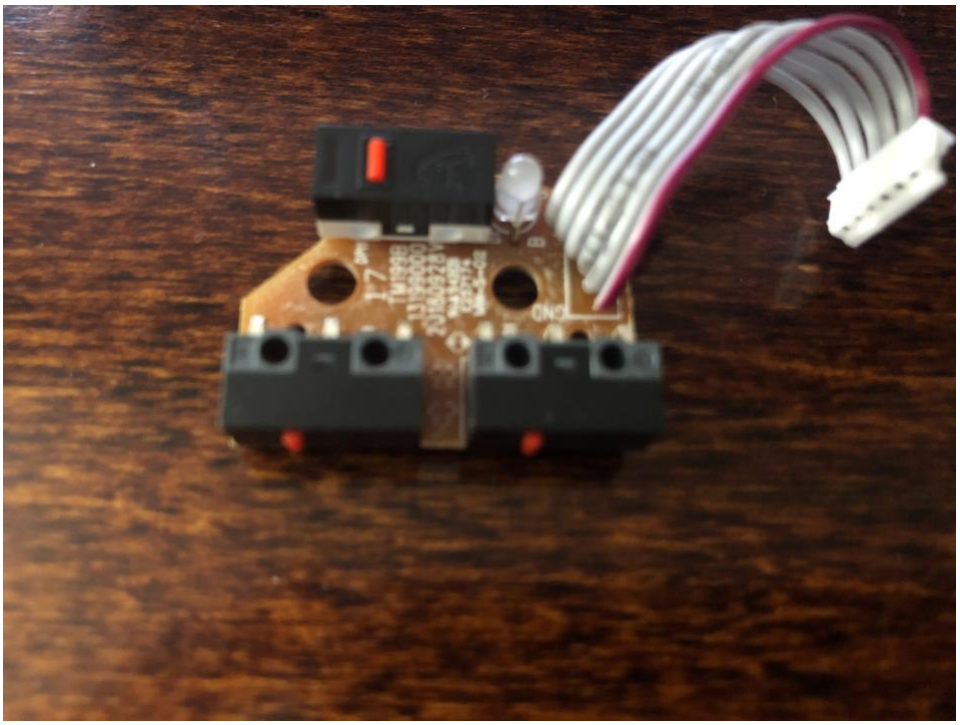
Back view of the mouse's main PCB, depicting the scroll wheel, circuit board parts, and buttons after taking off the shell



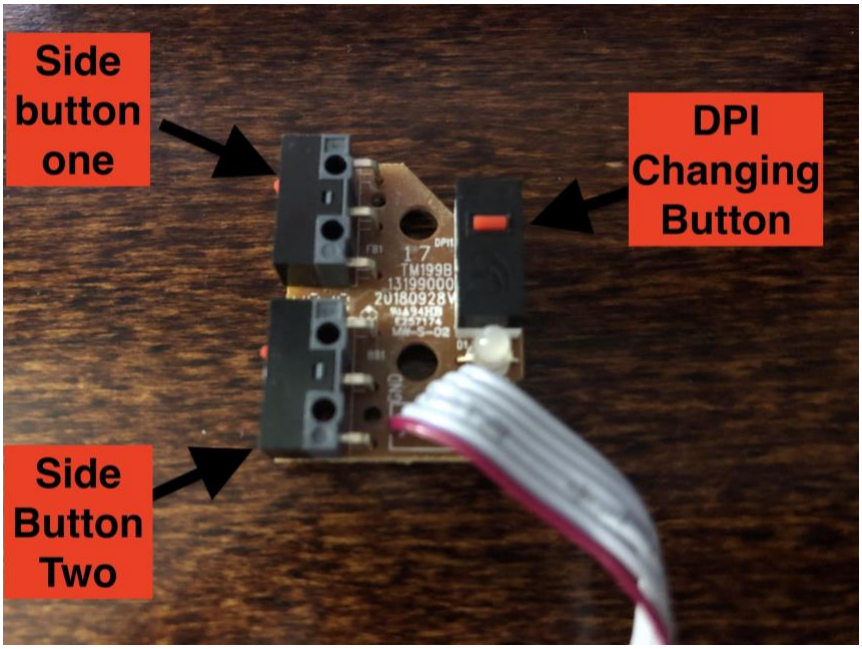
Side view of the mouse's main PCB. The main circuit board houses the majority of the mouse's components. This is where the processing, power, and output devices are; this is the "main" part of the mouse



Other side view of the mouse's main PCB depicting the scroll wheel encoder and another view of the optical sensor. From this view, you can see the rest of the parts of the main PCB. Again, every single one of the components on it is integral to the mouse's function.



Top down view of the second PCB from the shell of the mouse, including the two side buttons, DPI button, and LED. The secondary PCH is required to reach the DPI button on the top of the mouse and the two side buttons. This is basically a structural extension of the main PCB



Top down view of the secondary PCB. Again, here we can see the three binary switches: the DPI button and the two side buttons

Conclusion:

After deconstructing this wireless mouse, I have learned a lot about a product that many of us use on a daily basis. I learned how each component needs to work properly and in tandem with the other components to produce an appropriate outcome on the computer. It was actually surprising how much goes into a computer mouse and how complicated it can actually get, from the optical sensor to the scroll wheel encoder, to more simple sensors like the left or right click buttons. Deconstructing this mouse was truly a great learning experience about how sensors work together.