

Reverse Engineering an Acer Aspire Laptop

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Acknowledgment

I acknowledge my parents for their support, and ensuring safety during every step in this project.

List of internal parts of Laptop

1. Heat sink
2. Motherboard
- 3.HDD (Hard Disc Drive)
4. DVD (Digital Versatile Disc) drive
5. CPU (Central Processing Unit)
6. Keyboard
- 7.RAM (Random Access Memory)
8. USB (Universal Serial Bus) port
9. SD (Secure Digital) card
10. HDMI (High Definition Multimedia Interface)
11. WiFi Network card
12. Battery
13. CMOS (Complementary Metal Oxide Semiconductor) battery

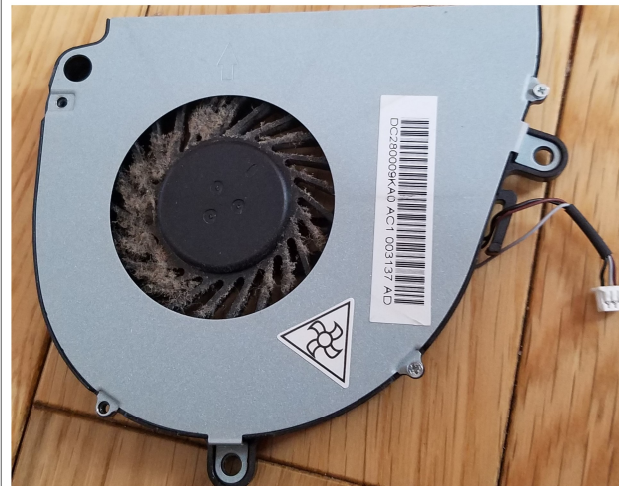
Introduction

I reverse engineered an old Acer Aspire 2011 model laptop. This laptop comes with Intel 2.3 GHz Core i3 microprocessor, 4GB RAM, 750 GB hard drive, and 15.6" display. This device has interesting connections and circuits, and is useful for everyday tasks. Reverse engineering an old laptop will help me understand how the device works and enable me to build futuristic models.

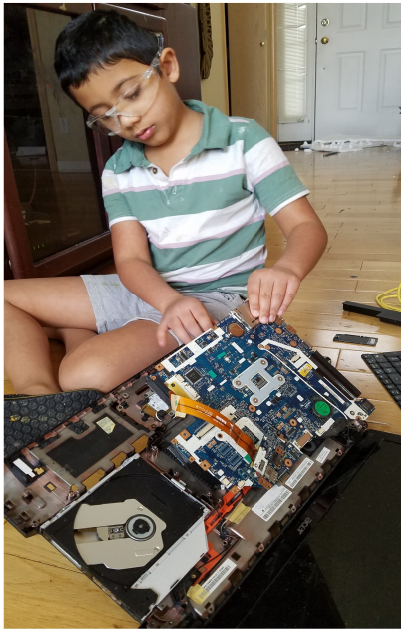
Internal parts of Laptop



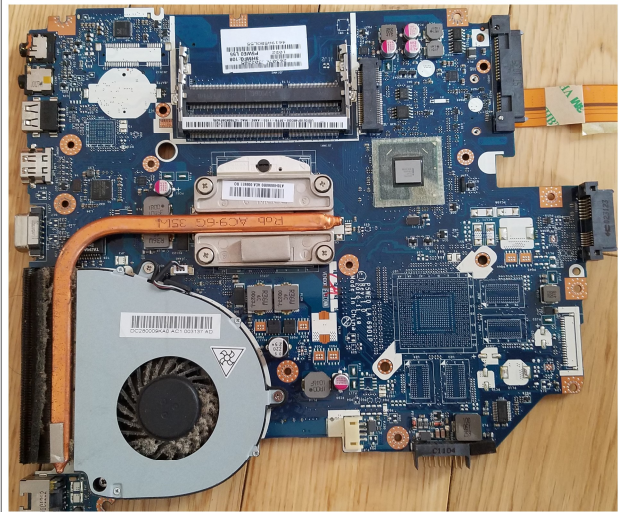
Figure 1: Unscrewing the heat sink (top) and fan (bottom)



The Heat Sink gets heat from the microprocessor and transfers it to the fan. The fan will dissipate the heat from the computer to the outside air. This repeats until the power is turned off. The fan turns on whenever the microprocessor is hot.



*Figure 2:
Removing
components from
the motherboard*



The Motherboard is the most important component in the computer. It holds and helps in communication between other components like CPU, RAM, SD card, USB port, coin cell battery, and ethernet cable port.



Figure 3: Sliding out the hard disk drive



HDD saves and loads data from computer. It has a platter that spins fast and has a magnetic coating which stores audio/video signals and computer data.



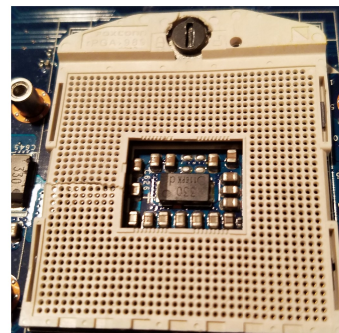
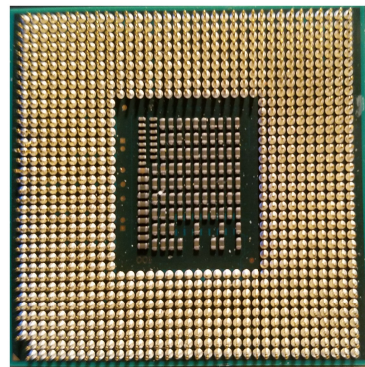
Figure 4: Using pliers to remove the DVD drive



DVD drive is a hardware component which allows a laptop to read and save with the disc. It has lenses which project electromagnetic waves that help read and write data on discs.



Figure 5: The microprocessor (top) and its socket (right) are below the heat sink



CPU is the brain of the computer. It is the electronic circuitry that computes mathematical/logical and input/output operations according to the program.

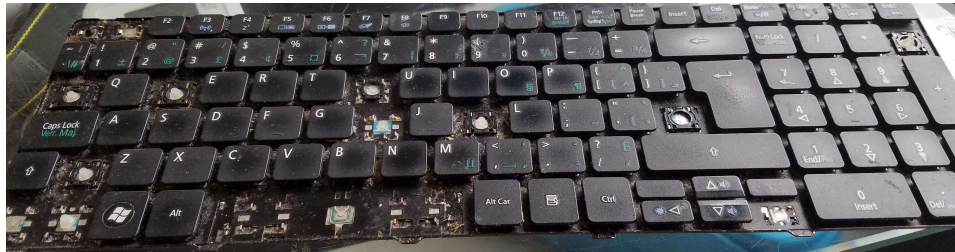


Figure 6: Keyboard dismantled from the chassis

Keyboard is an input device with multiple keys. When you press a key in the keyboard, the keystroke will go to RAM and save temporarily. The running software picks up the keystroke and decides if the command needs to be processed or displayed on the monitor.

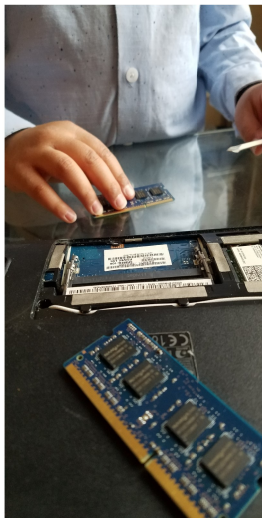
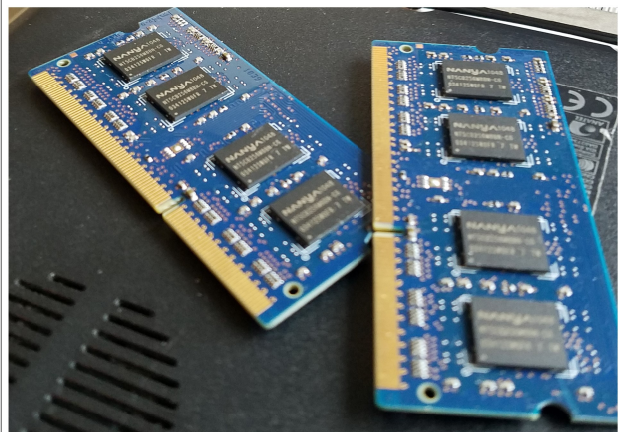


Figure 7: Pushing and pulling out RAM



RAM processes data quickly. If we have to do a task, the operating system will send data from the RAM to CPU and later, to the hard disc for long term storage. RAM is important for every day tasks. RAM stores data in its transistors with the help of electricity, so consistent power supply is needed to access data.

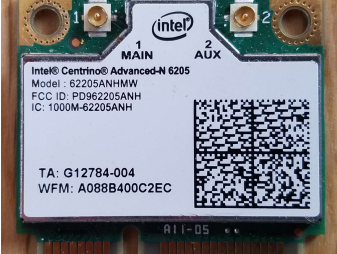


Figure 8: WiFi card after pulling out of motherboard

WiFi network card sends data from the laptop to the WiFi router and receives data from the router. In this way, the WiFi card is a transmitter and receiver.

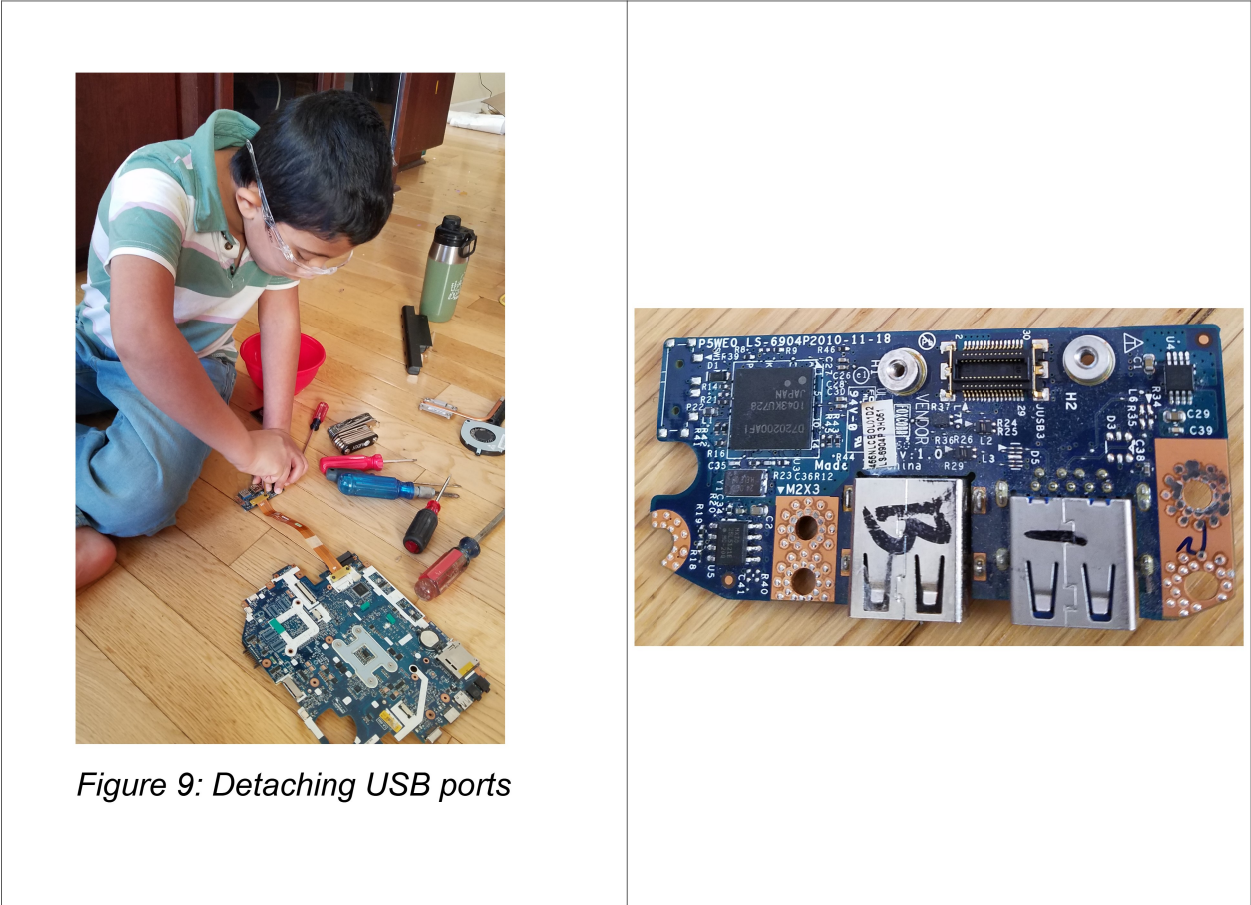


Figure 9: Detaching USB ports

USB port is universal because it connects other peripherals to the laptop. If you connect a camera, the USB port will get photos from the camera's memory card and store it in the laptop. Other ports include SD card, HDMI, and ethernet cable port.



Figure 10: After pulling out battery from its slot

The Lithium-ion battery gives portable power for the laptop. Battery is placed under the laptop and is replaceable. On the other hand, CMOS battery makes it possible for the laptop to remember the time and date by powering the system's clock.

Conclusion



Figure 11: Reverse engineering without damaging is challenging, but fun activity

In this project, I learned to dismantle the parts without breaking the laptop. I researched about every part and its contributions to keep the laptop functional.

References

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