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Project Presentation: TEI '21 Student Consortium

Project Outline: TEI '21 Student Consortium Paper

← Inspiration & Rationale Software: Calibration →

Hardware (July - December 2020)

Shopping List

£300 CombineReality Deck X Kit A (buy Kit B if you don't have access to a 3d printer for +£100)

£110 Intel T261

£100 Ultraleap Stereo IR 170 (or use a Leap Motion Controller if you already have one)

£510 Total Cost (£610 if you don't have access to a 3d printer)

3D Printing

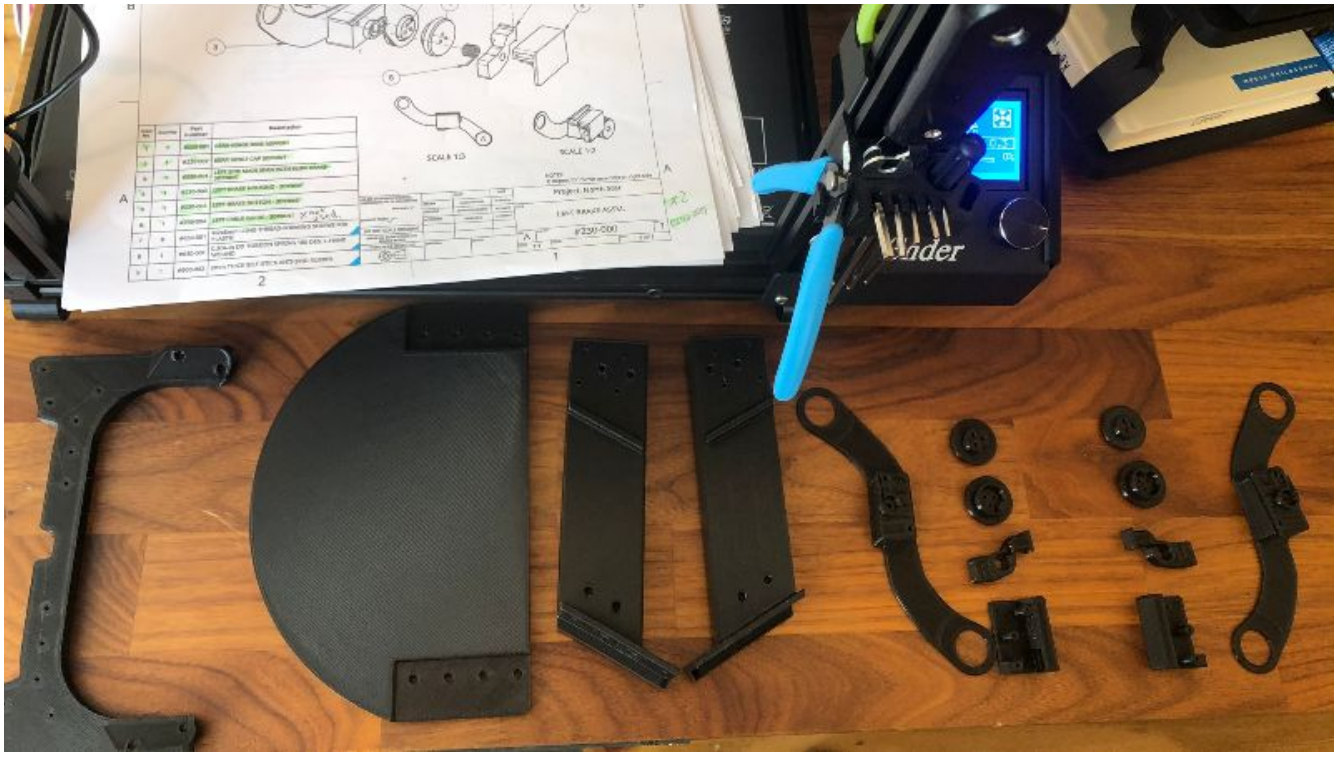
I started printing the parts (which are now available here) between July and September,

Electricals and Sensors

Building the headset involves assembling the electrical components and the sensors into the 3D printed parts. For the Deck X, these electrical components are:

- Intel T261 (6DOF Sensor)

- Ultraleap Stereo IR 170 (Hand Sensor)
- Display Board (The board which provides power to the two displays, and receives their signal via a mini Display Port cable)
- CombineReality Integrator (CR's solution to reduce cables: in older iterations of the HMD, you needed a USB cable to power the display board as well as each of the sensors. This amounted to four cables. The Integrator 'integrates' everything with one unidirectional USB C - A cable.
  - It contains a USB C hub to power and relay sensor data from two USB 3.1 and one USB 2.0 connectors
  - Sends power to the Display Board via a connector and capacitor board.
  - Contains a 3GB on-board flash drive
  - Features an arduino-compoatible microcontroller (allows further sensors, and integrates the D-Pad on the lid)
  - Power for a fan to cool the T261 and all other inner components
- Lid D-Pad (CR's 6 button solution to allow hassle-free calibration and easy resetting)
- Capacitor Board (to power the Display Board from the Integrator)
- Screens (two screens that add up to a 2880x1600 120Hz display extension to your computer)



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Some photos of my 3D printing process. Around January I updated to the Ultraleap Stereo IR 170 hand tracker from the Leap Motion Controller, which offers higher field-of-view. This required a reprint of the main optics bracket which is why the headset might look different in some pictures further along the process

Assembly

The full assembly guide for the CombineReality Deck X version of the North Star HMD is available here.

← Inspiration & Rationale

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Resources

Headset Documentation: Project North Star

Community: Project North Star Discord Server

Repository: Project Esky Renderer