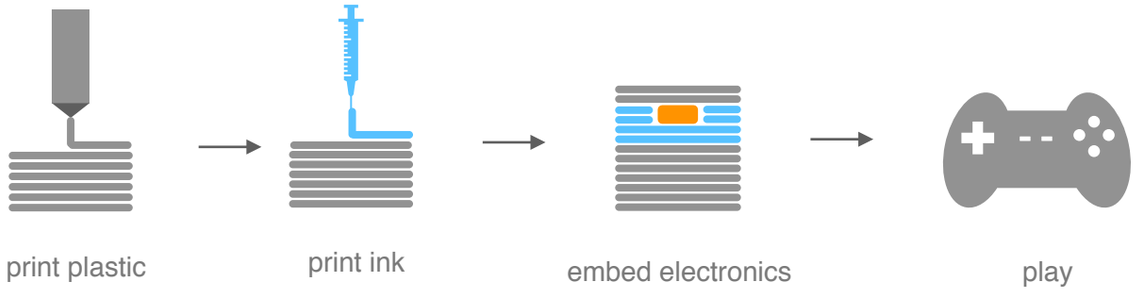
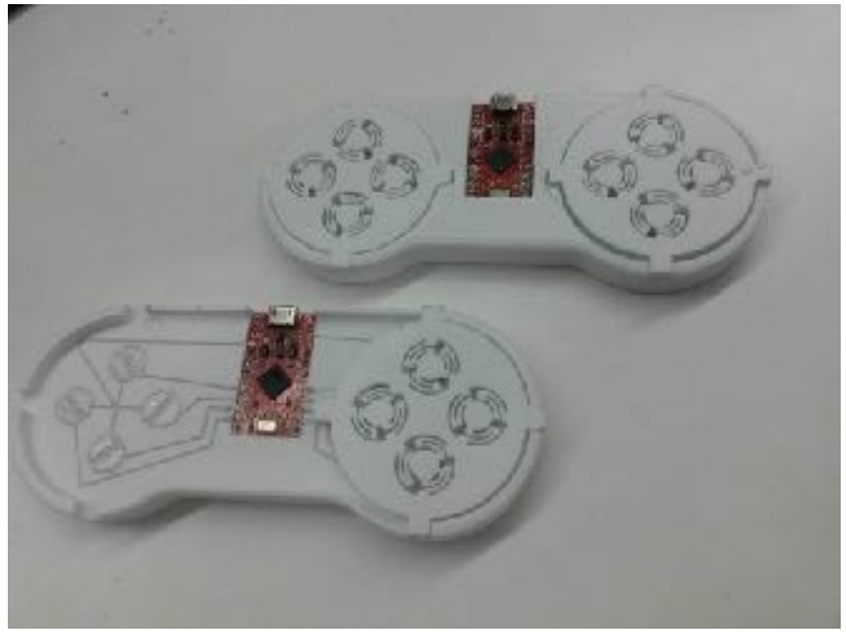
3D Printed Input Device

Project goal

To develop an input device that relies heavily on the Voxel8 3D Printing platform. This project would help showcase the ability of the Voxel8 printer such as embedded electronics and functional printing.

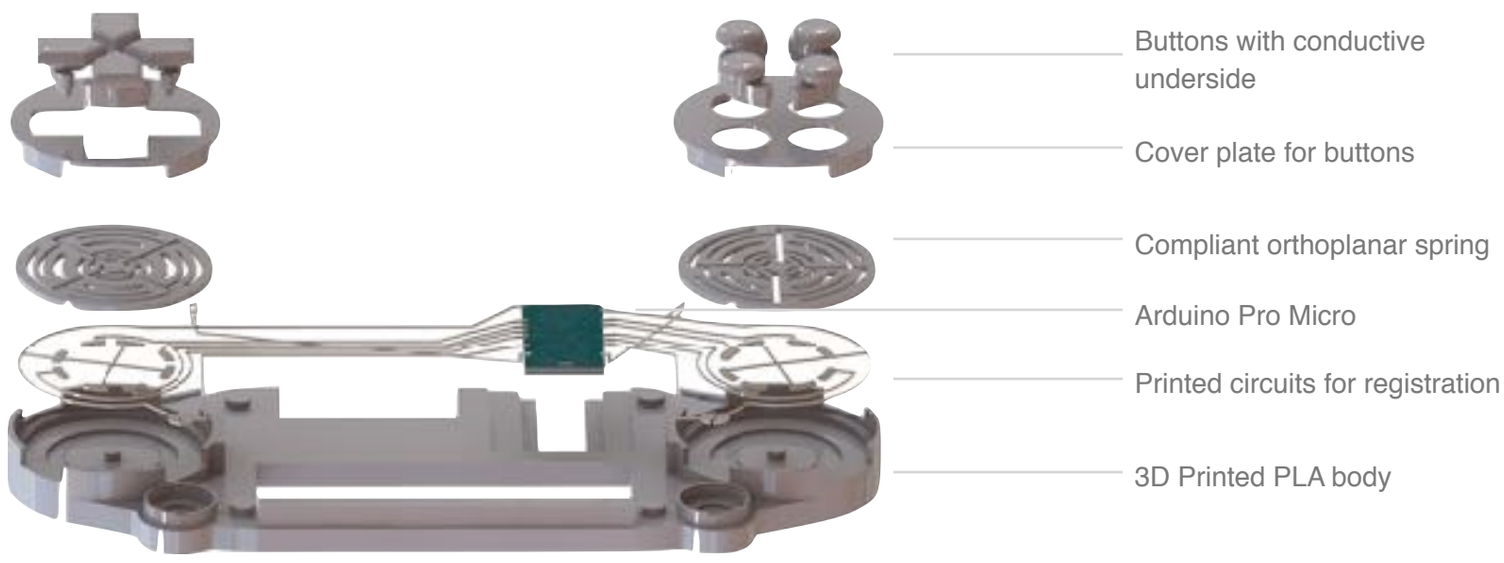




Functional printed prototypes

development

Printed several iterations to improve functionality of the device
Programmed HID driver for Arduino Pro Micro for detection as a generic USB input device
Tested successful prototypes with rigorous rounds of Mario Kart



3D Printed Input Device

Background

The device was prototyped using a voxel8 printer which is a 3D Printing platform capable of dual material printing and embedding electronics mid-print for functional prototypes

Mechanical functionality

The device relies on compliant mechanisms (orthoplanar springs) for the buttons and cantilever beams for the shoulder bumpers. Several rounds of iteration were done to assess and determine optimal press force and travel.

System functionality

The device uses an Arduino Pro Micro which houses a USB transceiver, allowing the device to be programmed as a generic USB input device. Button pressing was done by utilizing the pull up resistors in the I/O ports of the Pro Micro as open circuits, being shorted when the buttons were depressed