P-LEG v2.

BACKGROUND

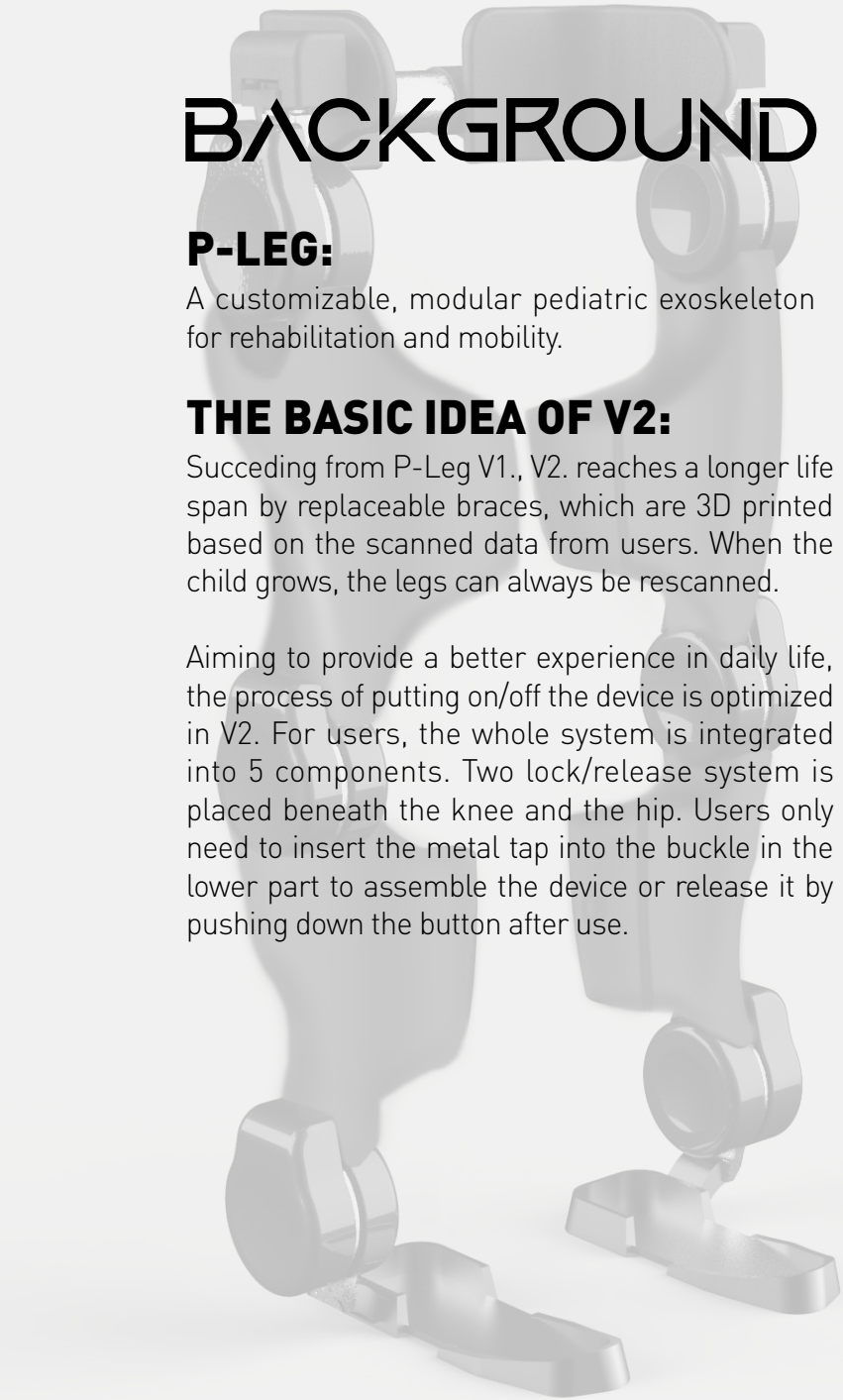
P-LEG:

A customizable, modular pediatric exoskeleton for rehabilitation and mobility.

THE BASIC IDEA OF V2:

Succeding from P-Leg V1., V2. reaches a longer life span by replaceable braces, which are 3D printed based on the scanned data from users. When the child grows, the legs can always be rescanned.

Aiming to provide a better experience in daily life, the process of putting on/off the device is optimized in V2. For users, the whole system is integrated into 5 components. Two lock/release system is placed beneath the knee and the hip. Users only need to insert the metal tap into the buckle in the lower part to assemble the device or release it by pushing down the button after use.

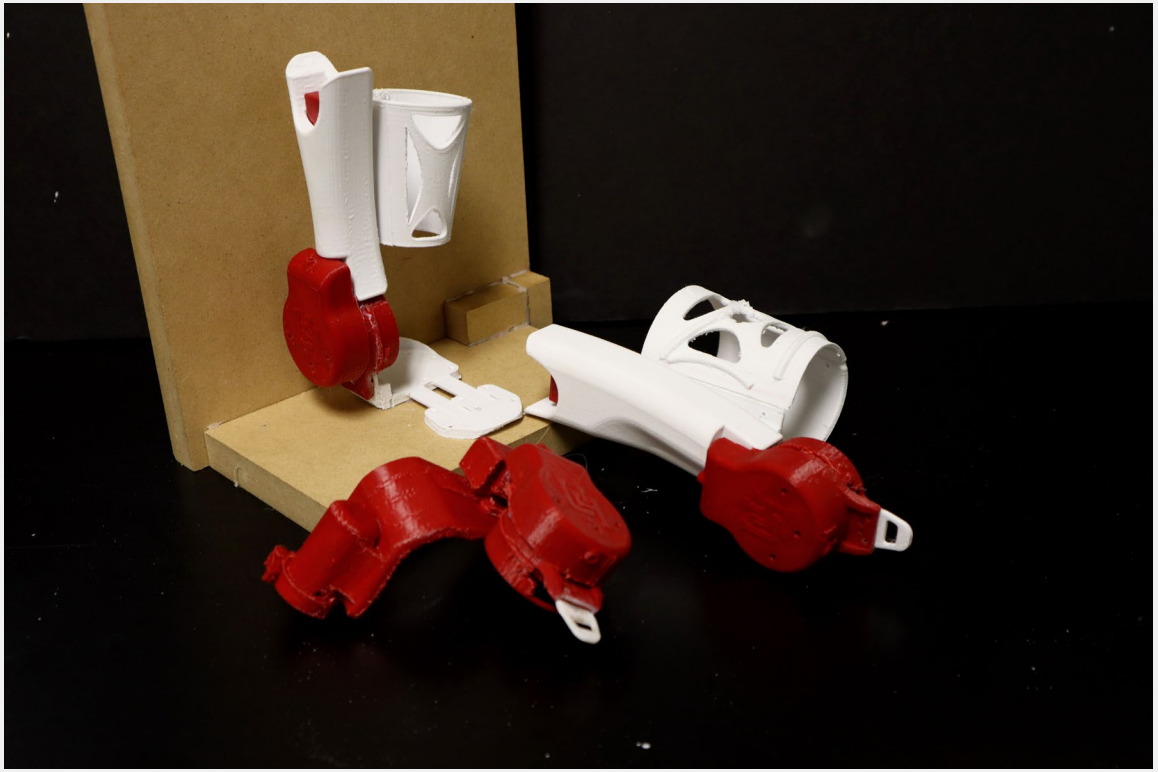


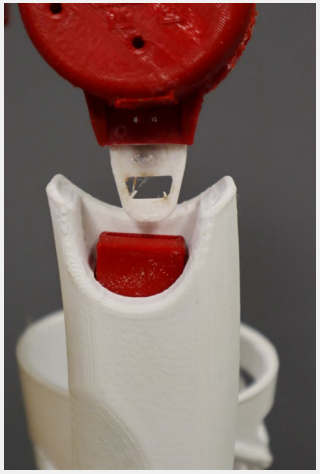
STUDY PROPOSE:

1) Reify the connection between components, especially for the transmission of electric power and signals.

2) Explore the integration of the braces and the rest of units.

3) Refine the forms of the whole product.

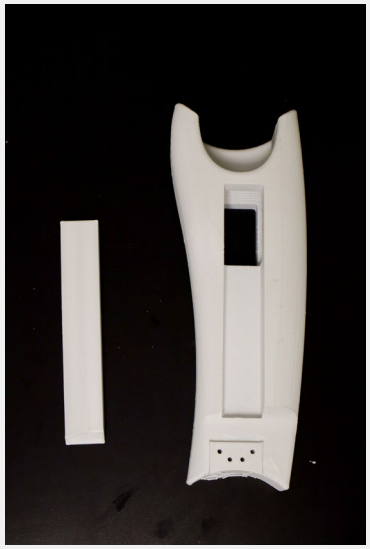




1/2-SIZE MOCK-UP

A half size mock-up was made via 3D print to demonstrate the basic form and function.

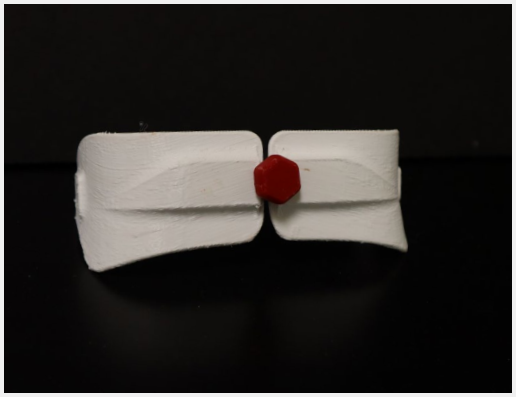
PROTOTYPE OF THE THIGH PART

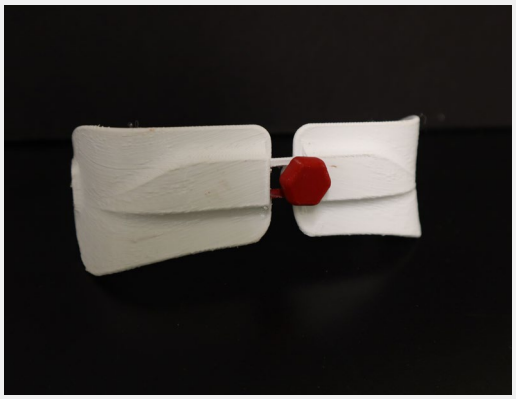


Several full-size prototypes of the thigh part were made. During the iterations, the design of the connection between it and the existing brace was determined, which lead to the completion of the structure of the thigh part.

FINAL DESIGN

The "thigh" and "shank" is printed with the same material of braces'(onyx). They are assembled by three units. Latches were set to assure the position is fixed and stable enough to lock braces and buckles.





An earlier version of adjustment which was driven by gear and rack was designed. Later it was abandoned because of its lack of stability.

ADJUSTABLE WAIST

TRANSMISSION OF POWER AND SIGNALS

Specialized connectors were designed to cater the our electrical needs. the connectors are set at the places that is shown in figures below. The electricity will go through the whole system when its physical form is assembled.