



The Tripawds

ENME 444 Mechanical Engineering Systems Design, Spring 2020
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Project Scope

Problem: Dr. Topoleski's three legged dog Yogi can't stand on his own when his right rear leg is out to his side.
Mission: Construct a prosthetic device that will allow Yogi to stand on hardwood floors unassisted.

System Requirements

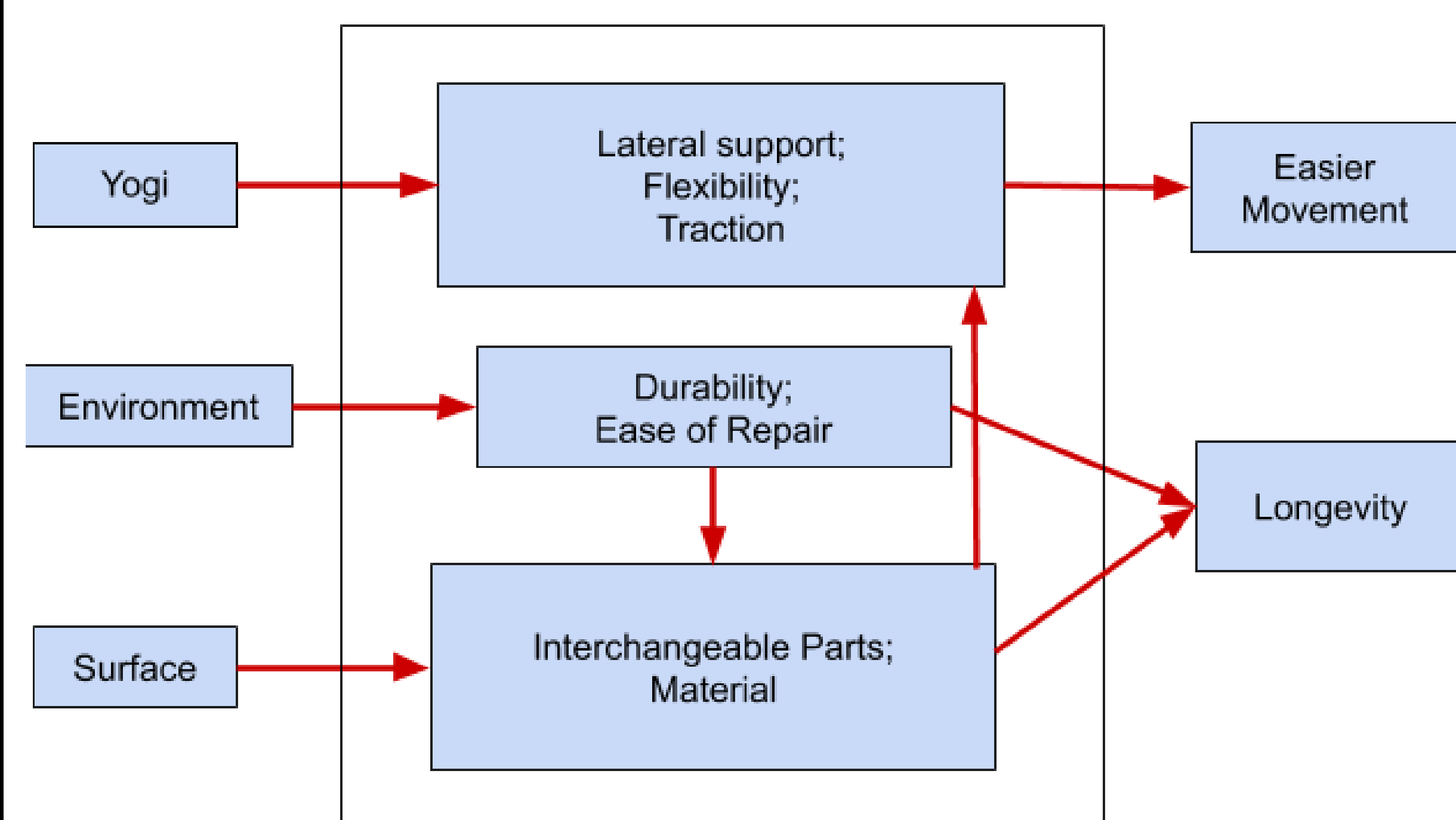


Figure 1: Functional Block Diagram

Client Specifications:

- Device shall fit in a 2'x2'x2' container
- Device shall use easily obtainable parts
- Device shall take less than 5 minutes to put on/take off

Prototypes 1-2

Prosthetic Leg Design:

Prototypes 1 and 2 focused on building a prosthetic leg off an existing harness to provide support and traction to Yogi as he stood.

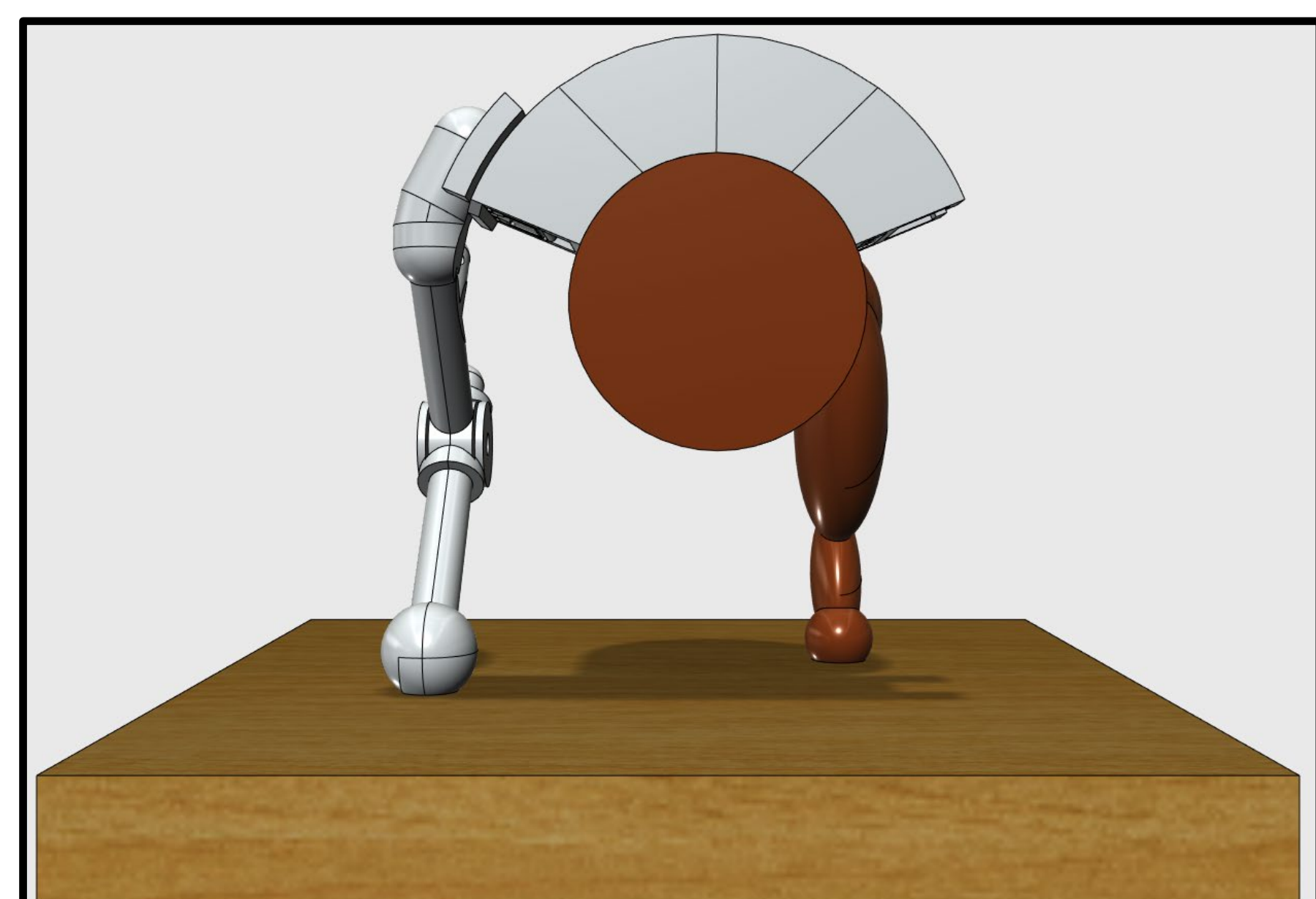


Figure 2: Prototype 1 used a rail system and elastic bands to provide support



Figure 3: Prototype 2 used a rigid plastic shell as a foundation to build a prosthetic leg off of

Prototypes 3-5

Dog Boot Design:

Prototypes 3, 4, and 5 concentrated on 3D printing a rubber dog boot that would improve Yogi's traction on hardwood flooring.

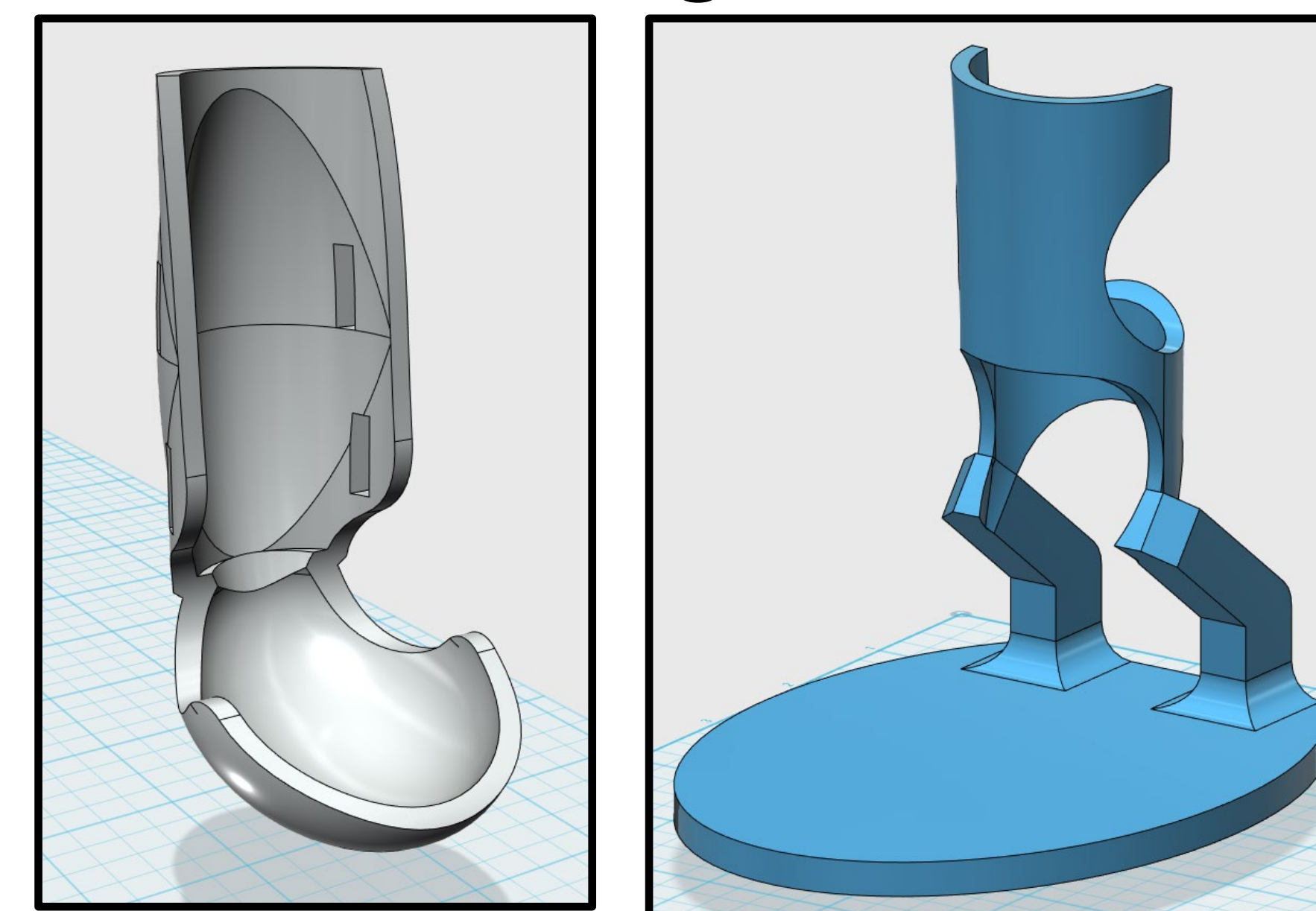


Figure 4: Prototypes 3 and 4 are different variations of a wearable dog boot.

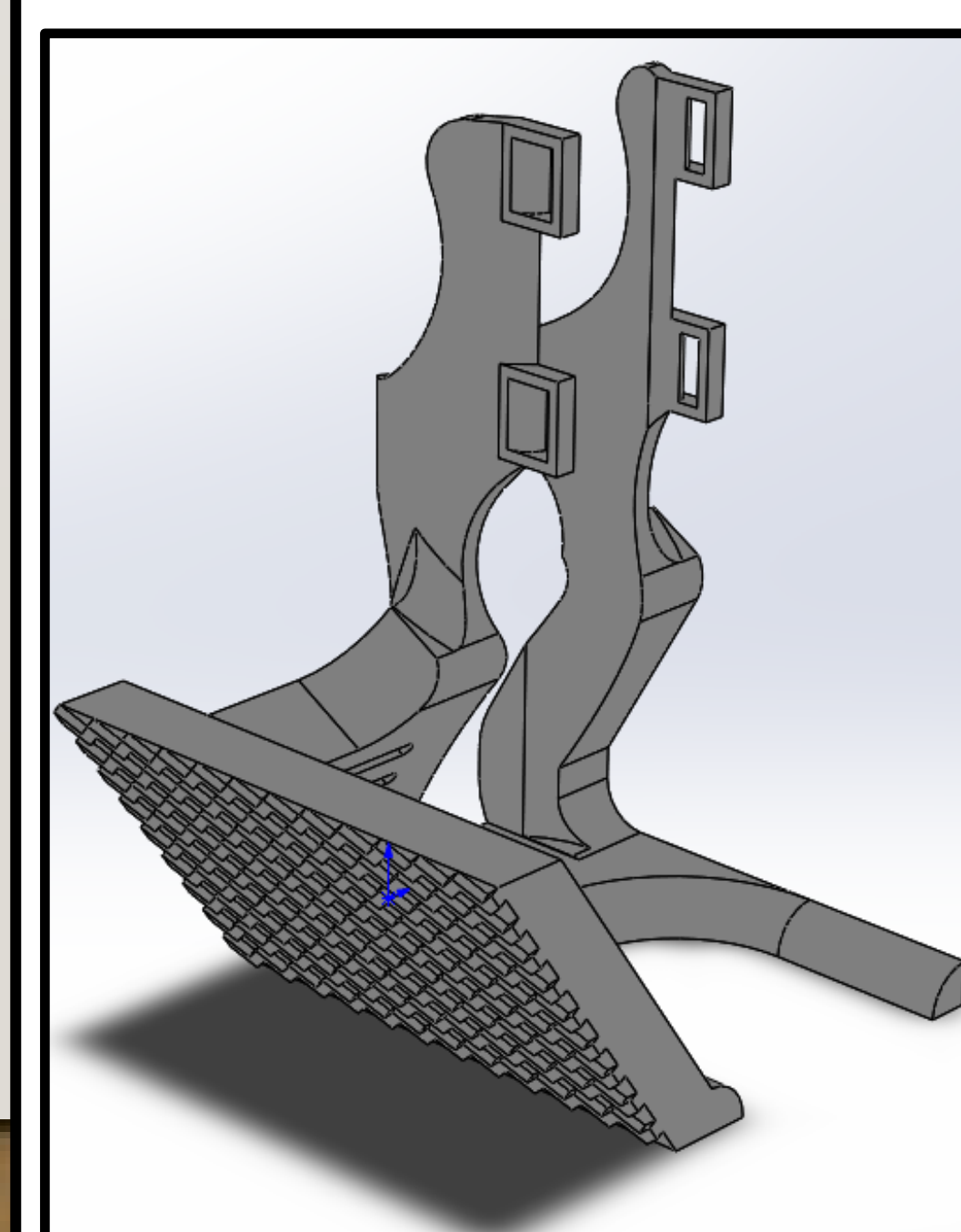


Figure 5 (Final): Prototype 5 improved comfort and function through an exposed sole for Yogi's paw and a textured pad on the right of the device.

Simulations and Testing

COVID-19:

The COVID-19 pandemic restricted testing to SolidWorks simulations.

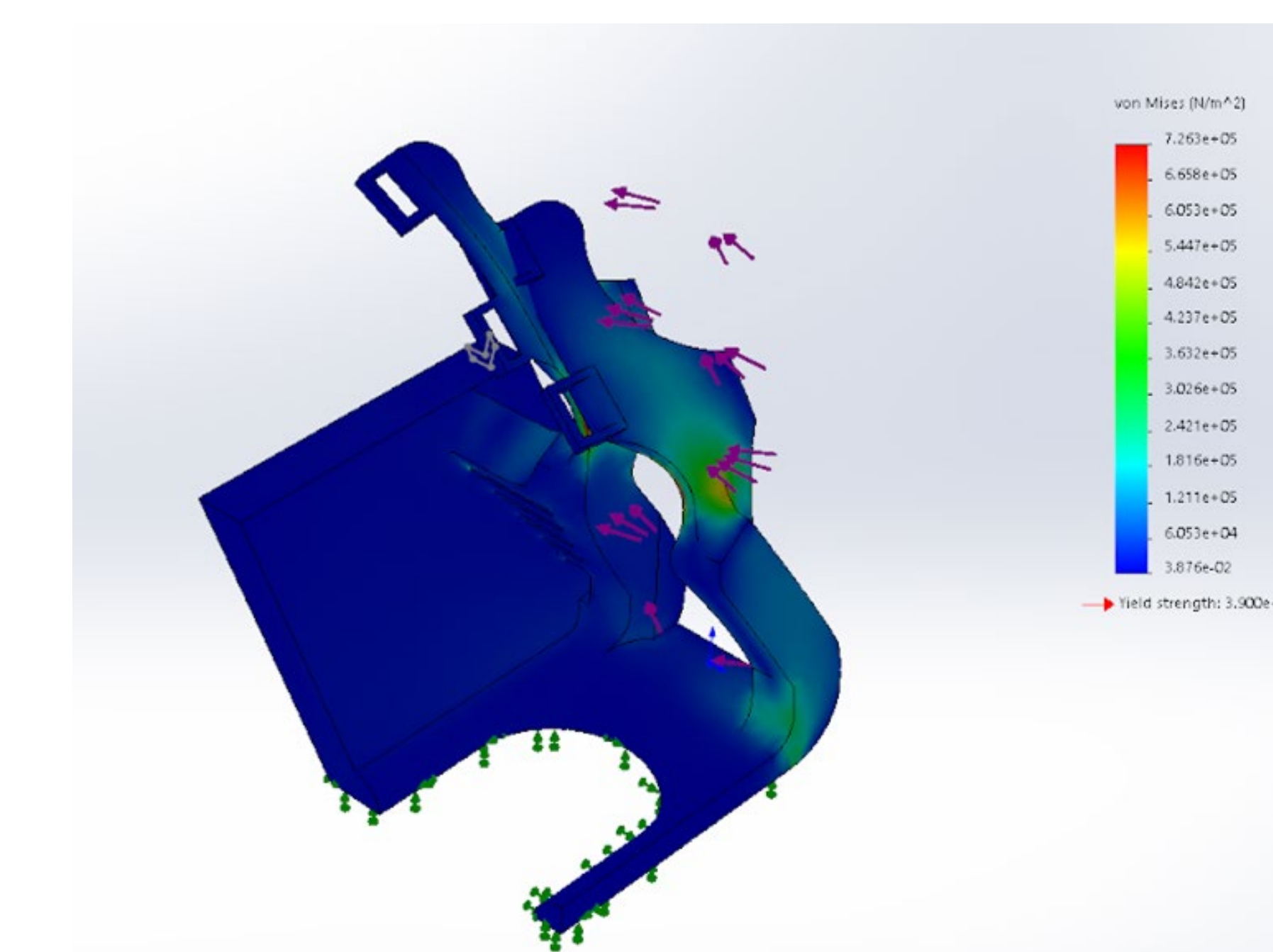


Figure 6: Forces ranging from 1N to 73N were used to simulate walking, standing up, and jumping.

