



# Puppy Prosthetics: A Method for Mobility Rehabilitation Implementing 3D Design



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## Engineering Need

Many amputated dogs have limited mobility, and prosthetic limbs are expensive and not common for dogs.

## Engineering Objective

The objective of this project is to improve the mobility of a dog that has an amputated front left limb

### AMPUTATIONS AND PROSTHETICS FOR DOGS

Many dogs sustain major injuries from tragic accidents, such as from car collisions

These injuries can make blood flow to the limb to be terminated, resulting in the need of an amputation

Some prosthetics are on the market for dogs, but they take a long time to manufacture and are expensive

So, many dog amputees do not use an assistive technology device after their amputation, leading to many health problems

### METHODS

Take measurements of the client

Sketch designs, and transfer to CAD in order to prep for 3D printing

Test the prosthetic with the client

Using data, reiterate design

Criteria	Weight	Competitor	My Prosthetic
Lightweight	8	4	6
Comfortable	8	4	7
Manufacturing efficiency	5	1	5
Low maintenance	4	2	3
Total	25	11	21

## Prototypes

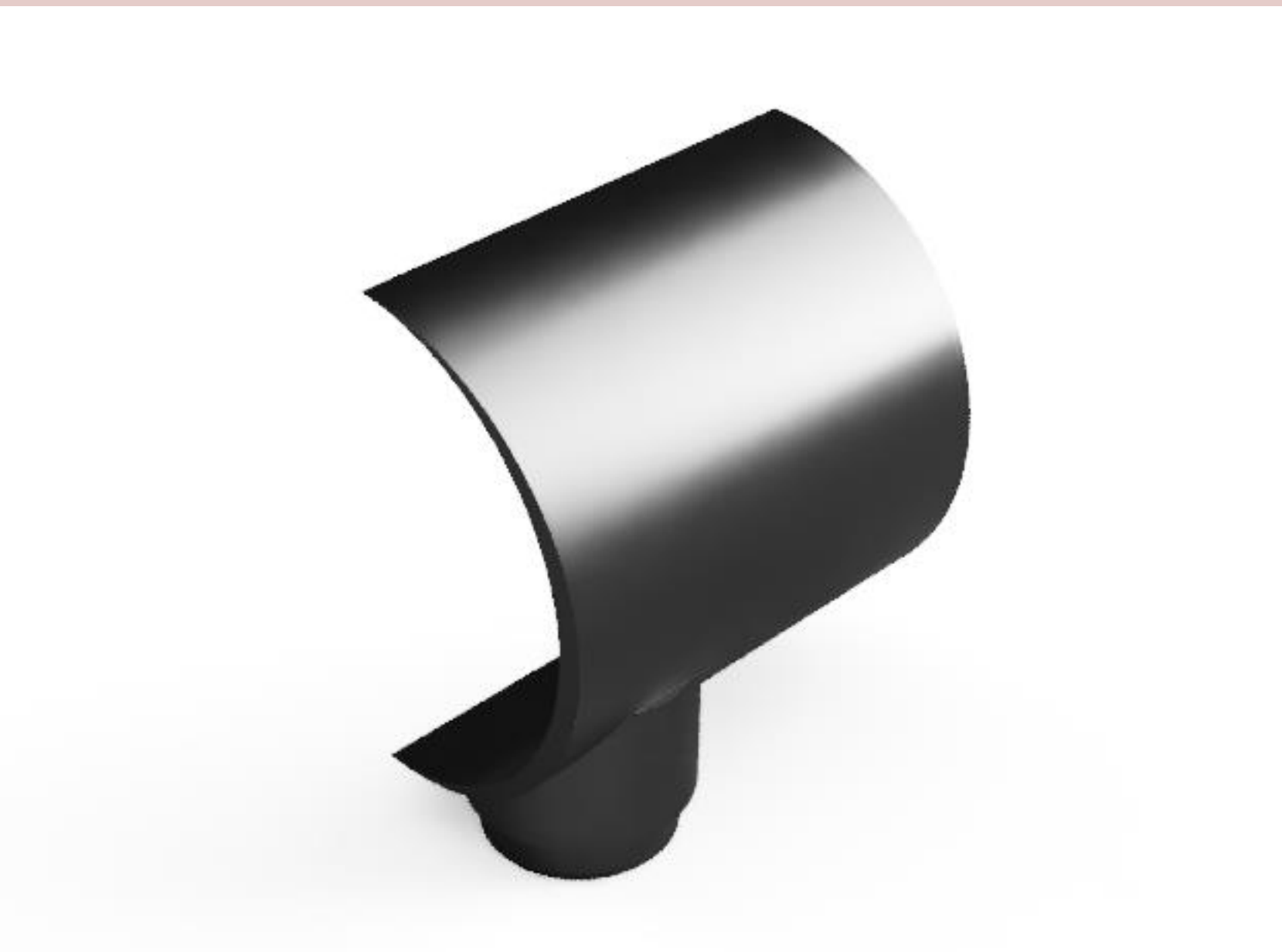


Figure 3: CAD assembly of the final prosthetic leg



Figure 4: Client wearing the leg

## Results

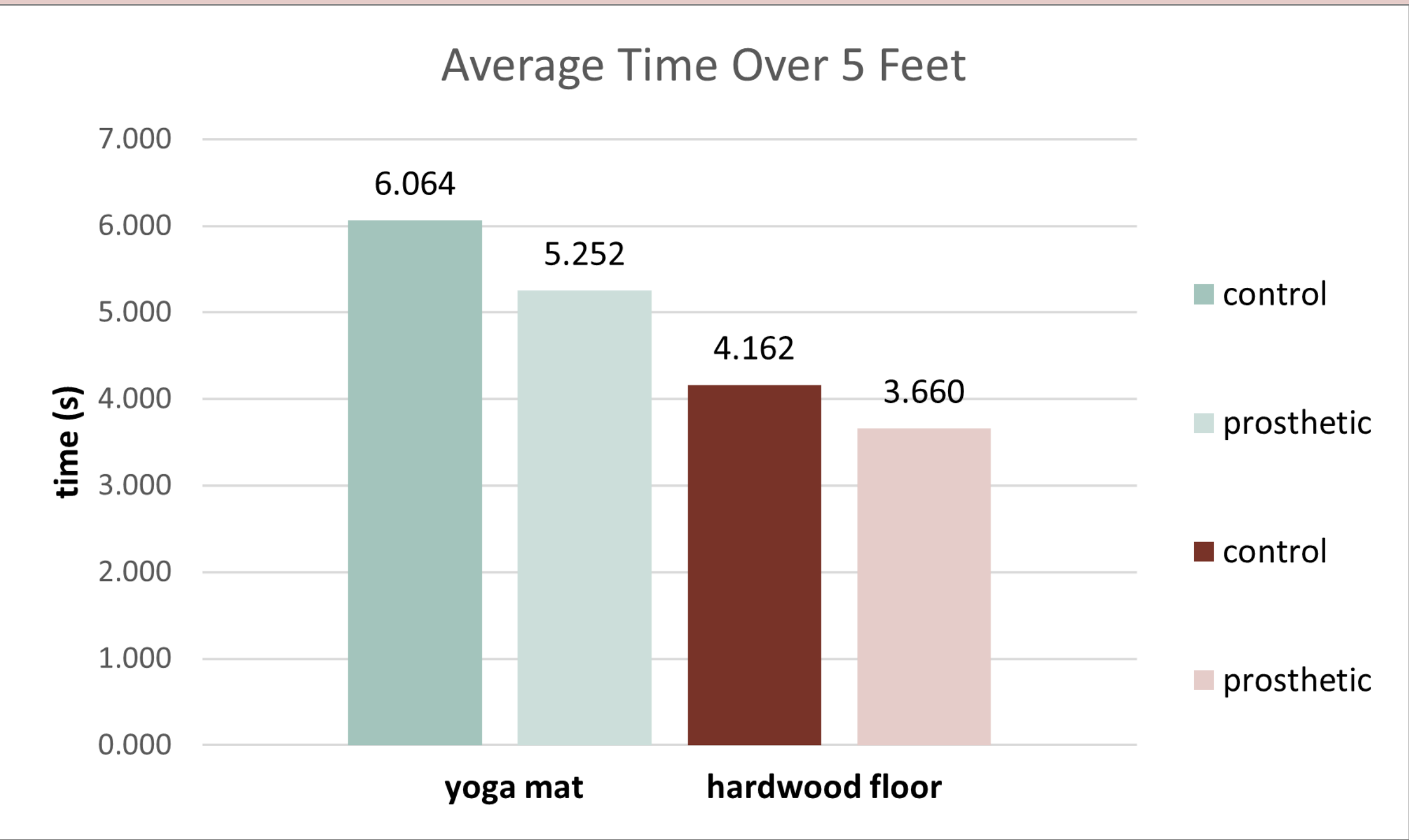


Figure 5: Graphs depicting speed without vs. with the prosthetic limb

## Analysis

- The average speed of Socrates' increased by 12.73%
- His angular movement decreased by 5.26%, proving increased stability
- This clearly shows effectiveness of the prosthetic limb

## Discussion

- Analysis of the C Matrix leads to positive conclusions about the prosthetic leg
- This device printed quickly, in approximately 10 hours
- Cost approximately \$15
- Client is now able to wear a harness