

How We Gained a Competitive Edge in the Paralympics Using Fusion360 and 3D Printing

Paul Sohi

Fusion360 Evangelist and Product Designer
@fusePS

Class summary

Learn how we made a completely new kind of competitive racing Prosthetic using Fusion360, cloud technologies, and remote working with digital manufacturing

Key learning objectives

At the end of this class, you will be able to:

- Learn how T-Splines helped us to make a Prosthetic
- Learn how to take advantage of Fusion, Fusion360, ReMake, and Remote working
- Learn how Digital Manufacturing can radically improve your lead times, and help you to make better products
- Learn how to use Simulations to prepare your products for the real world

“Never Stop Spinning.”

Denise Schindler



Building a Prosthetic

Digital vs. Analogue, Bringing the Future of Making Things to an Industry





**Total Money Wasted:
€12,000**

So why do it Digital?
Because it's Better.



**Taylor: CNC and
co-designing
San Francisco**



**Paul: Lead Design,
Manufacture
London**

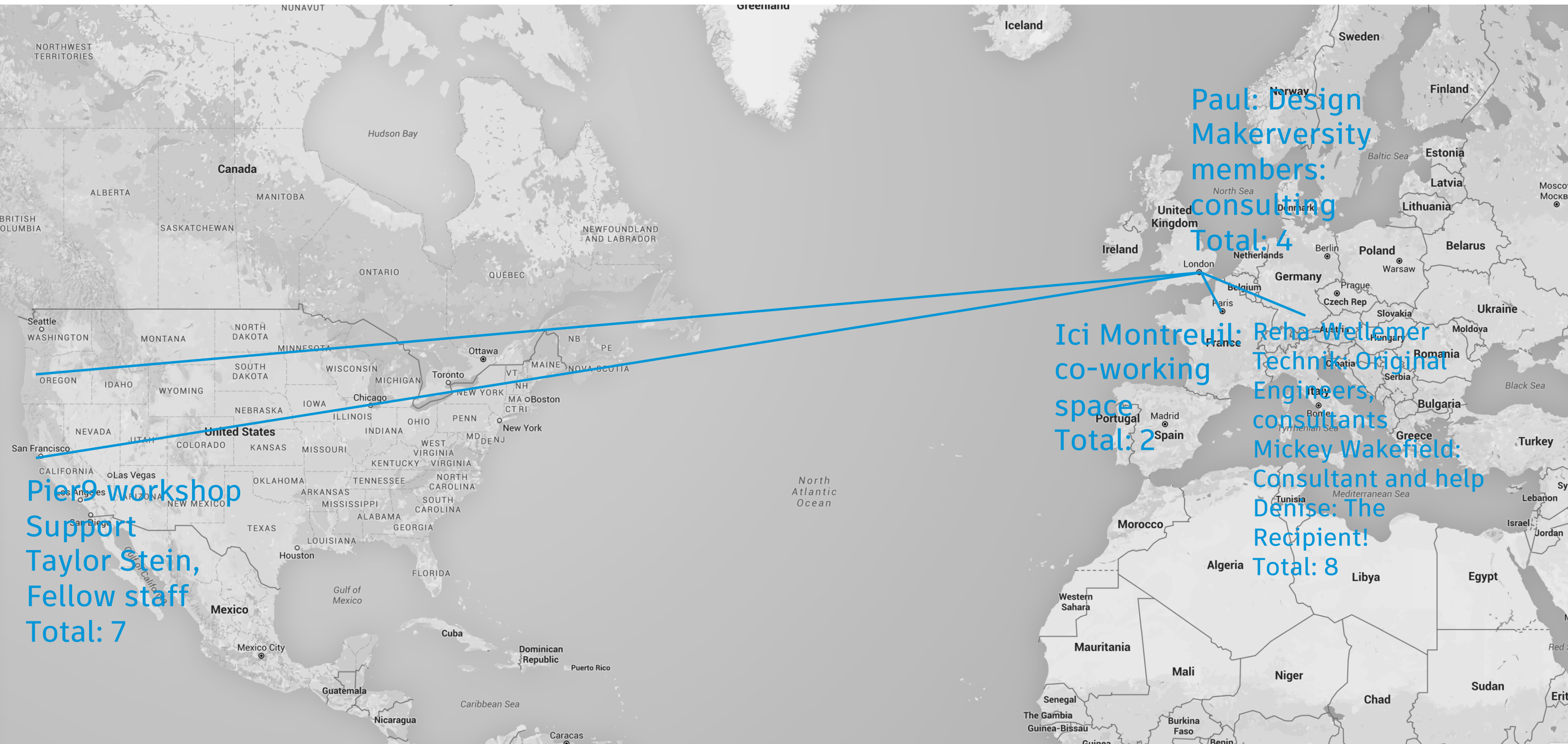


**Mickey: Project
Advisor
Munich**















**Myles: The intern!
Cleat Design
Portland**

The whole team




Total team/support:22

[Upload](#) [New Folder](#)  

Name ▲	Owner	Type	Size	Last updated
 Wiki Pages	Lieven Grauls	Folder		
 cleat	Paul Sohi	Folder		Nov 4, 2016
 Everything	Paul Sohi	Folder		Nov 4, 2016
 Paul's visualisation passes	Paul Sohi	Folder		Nov 4, 2016
 scans	Paul Sohi	Folder		Nov 4, 2016
 valve cap	Paul Sohi	Folder		Nov 4, 2016
 002 V4	Paul Sohi	Fusion Design		Jul 22, 2015
 Denise 1a V2	Paul Sohi	Fusion Design		Jul 19, 2016
 Denise_Leg V6	Lieven Grauls	Fusion Design		Apr 12, 2015
 Denise_Leg_Fusion V7	Michael Wakefield	Fusion Design		May 28, 2015
 Ruth_bein_splined V2	Michael Wakefield	Fusion Design		Oct 14, 2014
 streamline for CFD v5 v13 V1	Paul Sohi	Fusion Design		Apr 30, 2016









Details
Activity



Rehatechnik Wellmer
 5 SubFolders, 6 Files
 Project Type: **Secret**

[Joined Project](#)
[Follow](#)
[Pin](#)

PROJECT MEMBERS (8) [Invite](#)

- 
Paul Sohi
paul.sohi@autodesk.com
Editor
- 
Lieven Grauls
lieven.grauls@autodesk.c...
Project Admin
- 
Taylor Stein
taylor.stein@autodesk.com
Editor
- 
Michael Wakefield
mickey.wakefield@autodesk.com
Editor
- 
Daniel Noviello
daniel.noviello@autodesk.com
Editor
- 
Werner Degraeve
werner.degraeve@autodesk.com
Editor
- 
Colin Smith
colin.smith@autodesk.com
Editor
- 
Bankim Char
bankim.chareg...r@autodesk.c...
Editor


[View Members Details](#)

Upload

Name ▲	Owner	Type	Size	Last updated
Wiki Pages	Lieven Grauls	Folder		
cleat	Paul Sohi	Folder		Nov 4, 2016
Everything	Paul Sohi	Folder		Nov 4, 2016
Paul's visualisation passes	Paul Sohi	Folder		Nov 4, 2016
scans	Paul Sohi	Folder		Nov 4, 2016
valve cap	Paul Sohi	Folder		Nov 4, 2016
002 V4	Paul Sohi	Fusion Design		Jul 22, 2015
Denise 1a V2	Paul Sohi	Fusion Design		Jul 19, 2016
Denise_Leg V6	Lieven Grauls	Fusion Design		Apr 12, 2015
Denise_Leg_Fusion V7	Michael Wakefield	Fusion Design		May 28, 2015
Ruth_bein_splined V2	Michael Wakefield	Fusion Design		Oct 14, 2014
streamline for CFD v5 v13 V1	Paul Sohi	Fusion Design		Apr 30, 2016


Details
Activity

streamline updated new stump v331.png



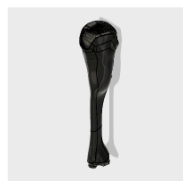
Paul Sohi uploaded
Nov 1, 2016

streamline updated new stump v33.png




Paul Sohi uploaded
Nov 1, 2016

streamline updated new stump



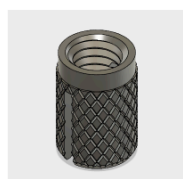
Paul Sohi updated
Oct 21, 2016

display



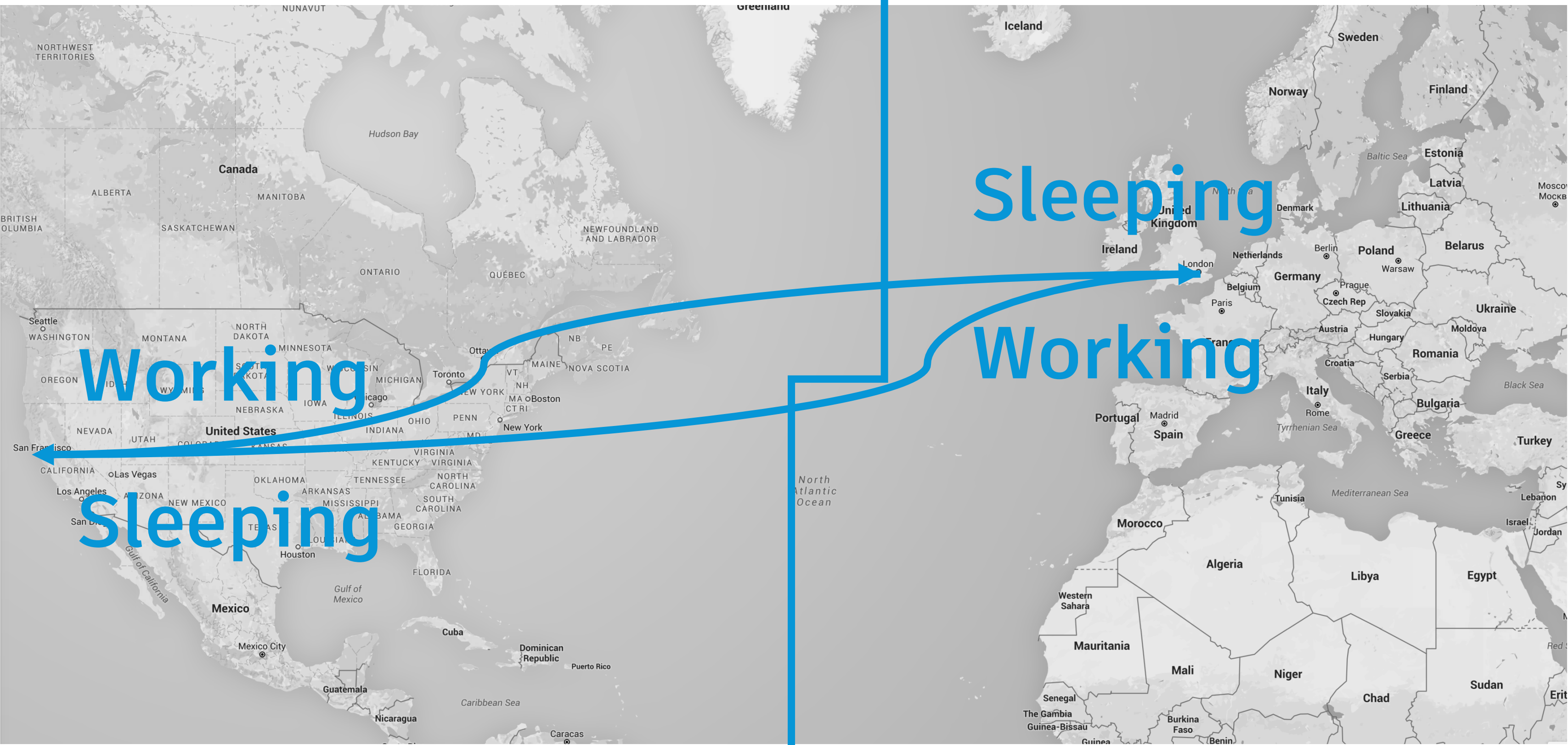
Paul Sohi updated
Aug 31, 2016

threaded insert



Paul Sohi uploaded
Aug 31, 2016

M5 12mm socket



Working

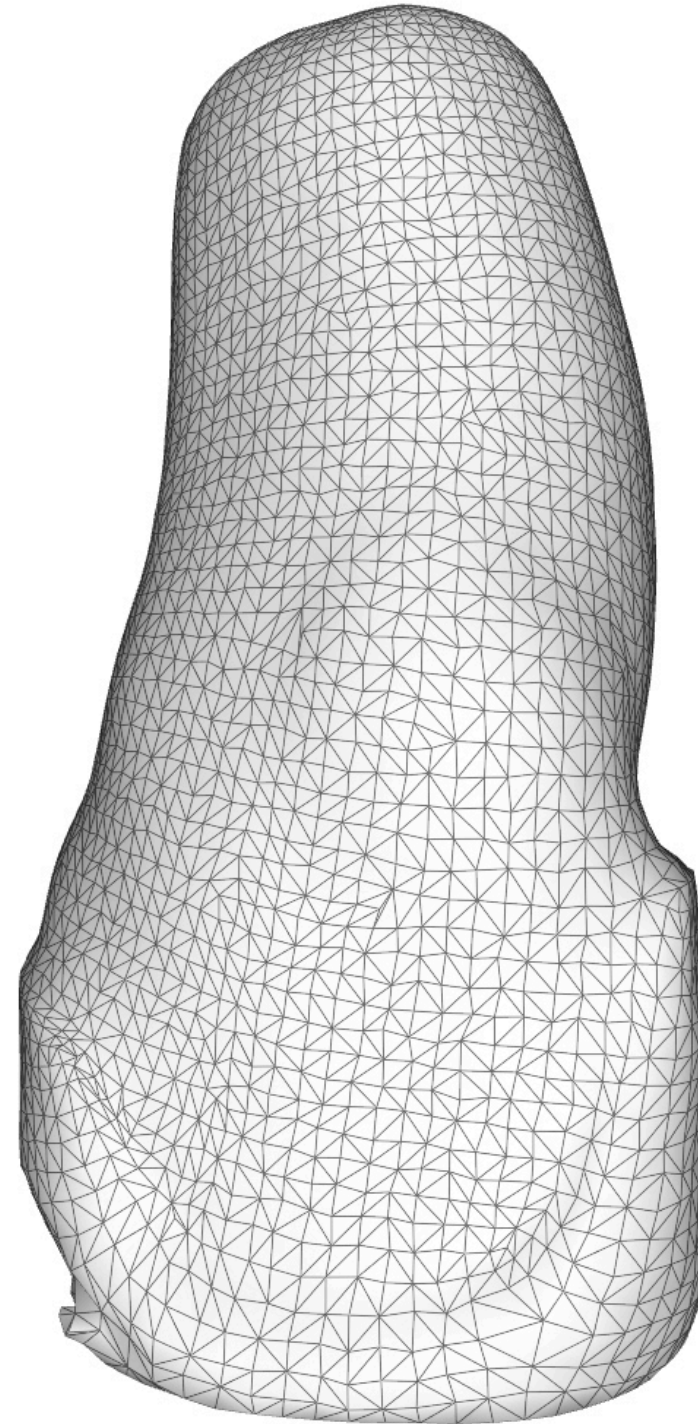
Sleeping

Working

Sleeping

Never Stop Spinning

15minutes vs. 1 week.

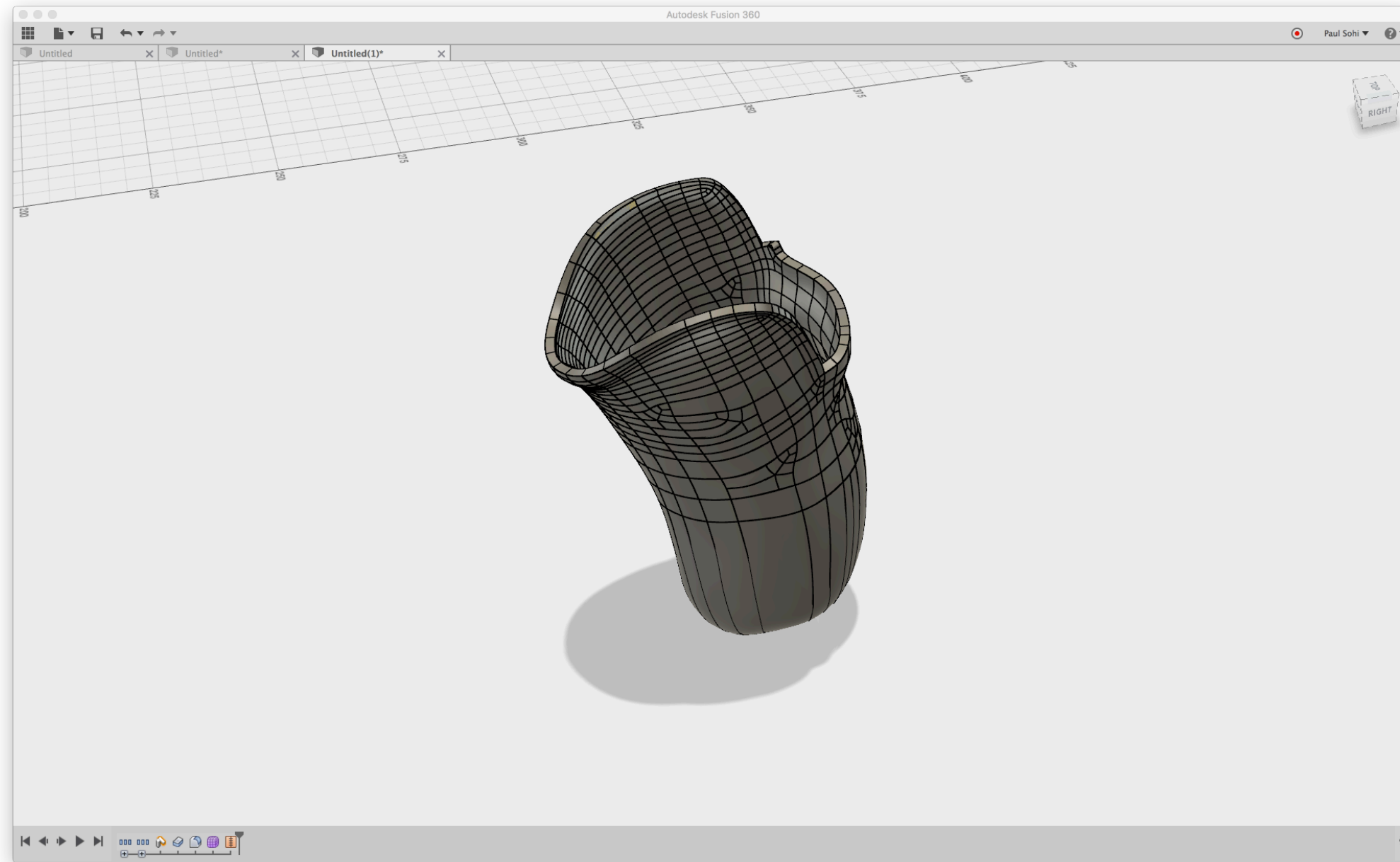


 | AUTODESK® ReMake

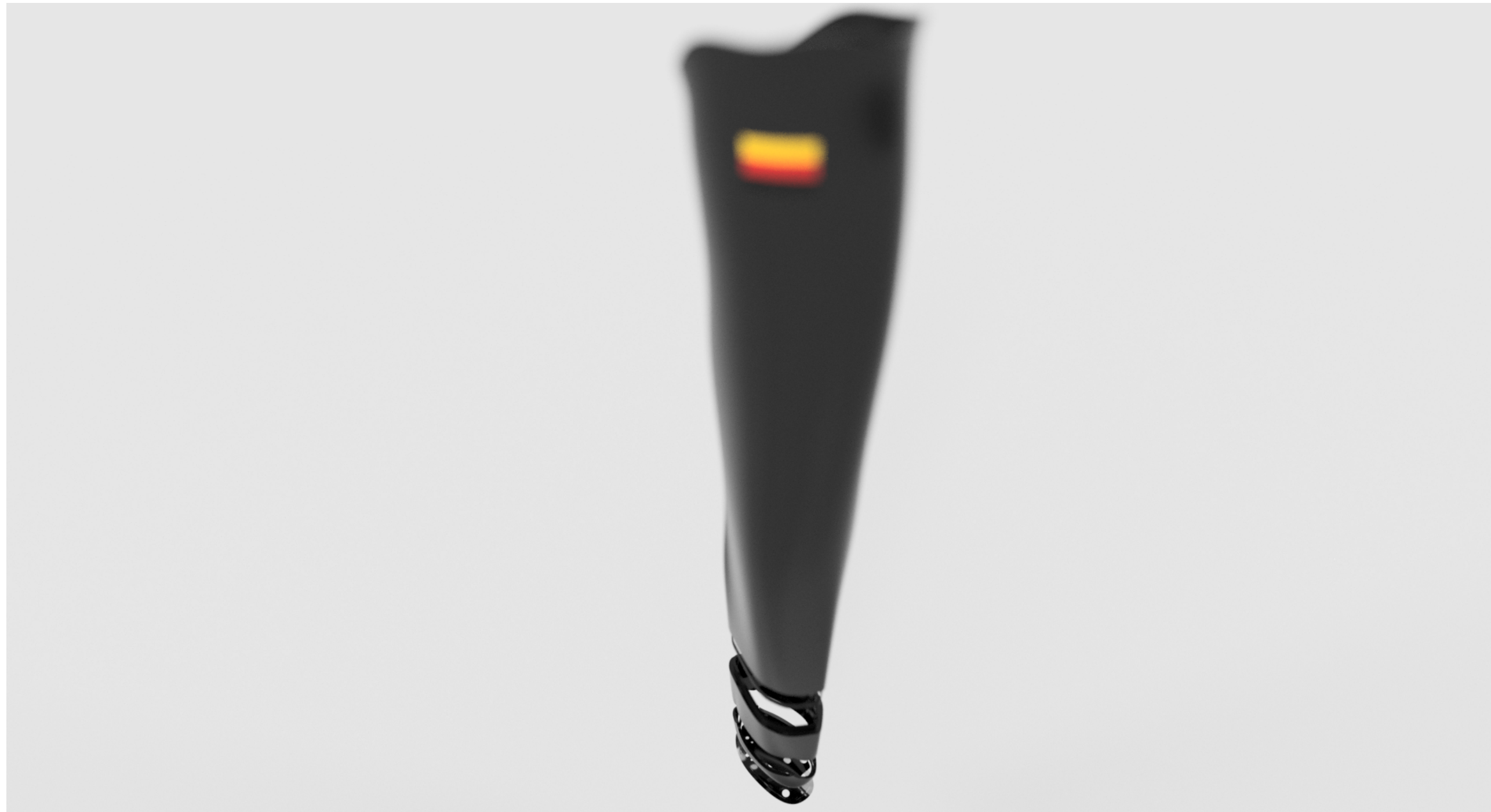
Concept Model



T-Spline first pass



MK 1



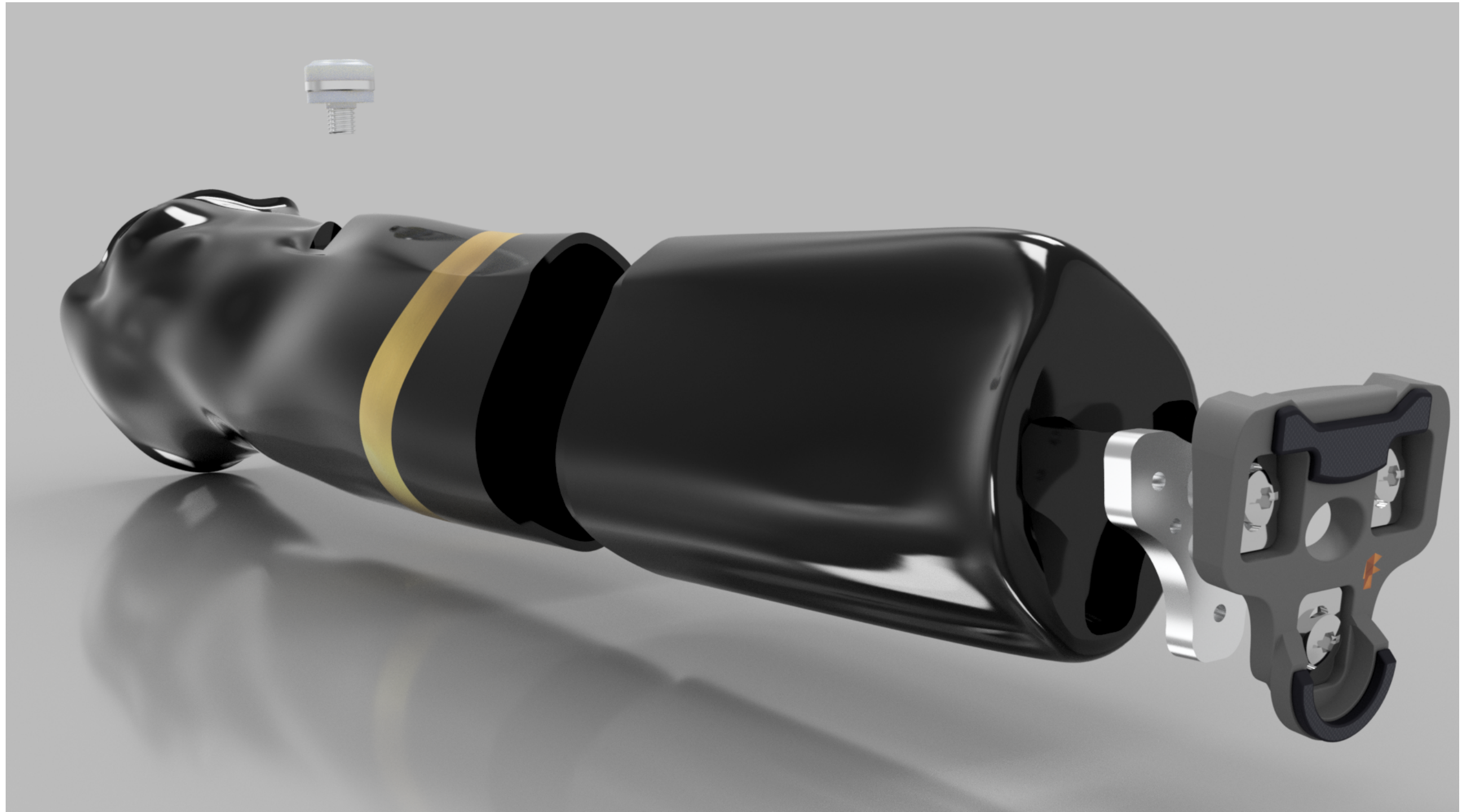




MK 2



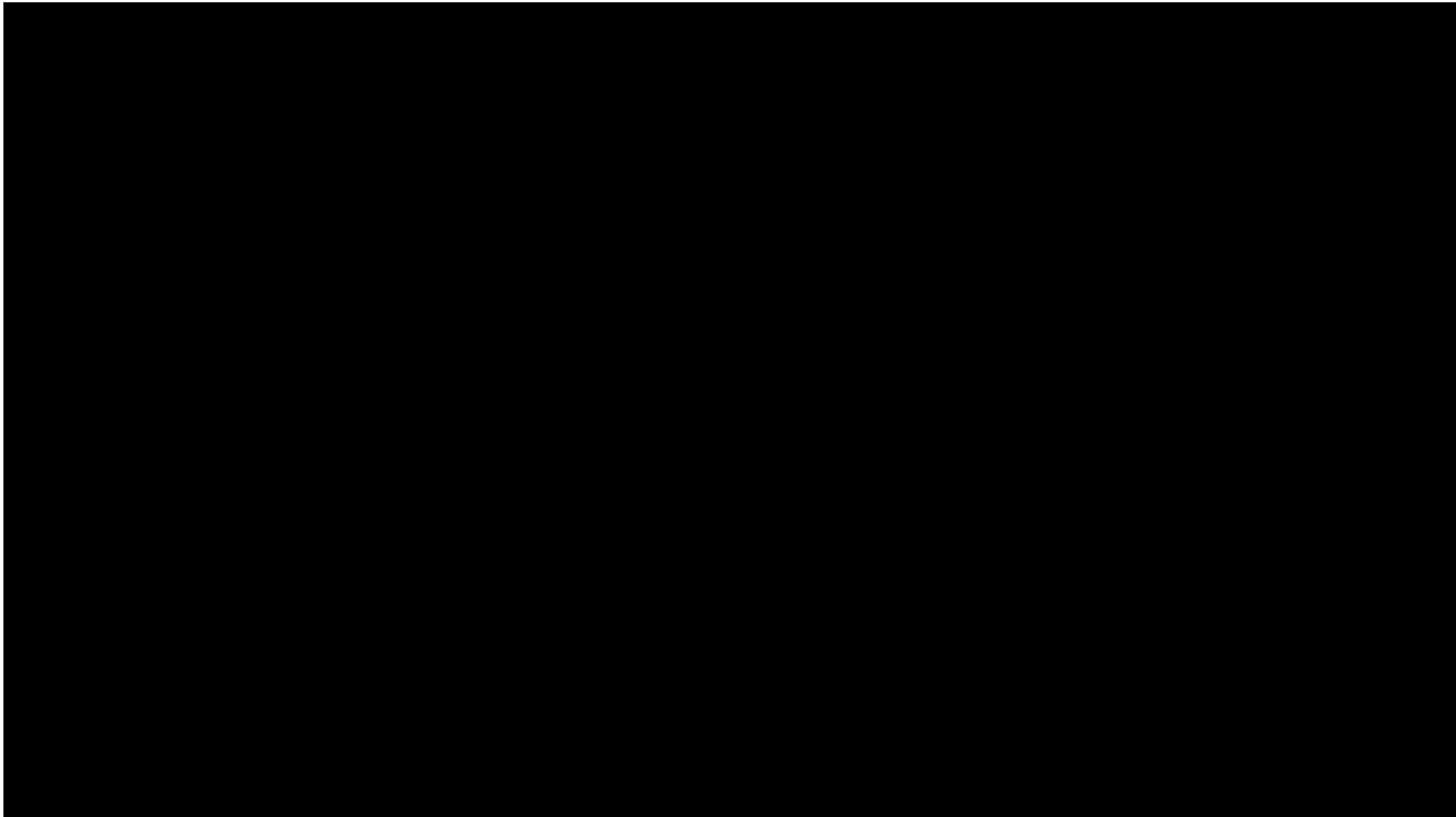
MK 3



MK 3







The Comparison

- Carbon Fibre: 1.2 Kg
- Polycarbonate 1.4Kg
- Production analogue: 10 weeks
- Production digital: 10 days
- Cost of original: €12,000
- Cost of digital: £2.5
- Digitally distributable files
- Access to skills worldwide
- Global team work
- Optimised for a specific person in software
- Weight, gait, bias, force, buckle, pressure, pain points, can all be simulated in software, replicating analogue processes much faster
- Production moves from a local base to anywhere in the world



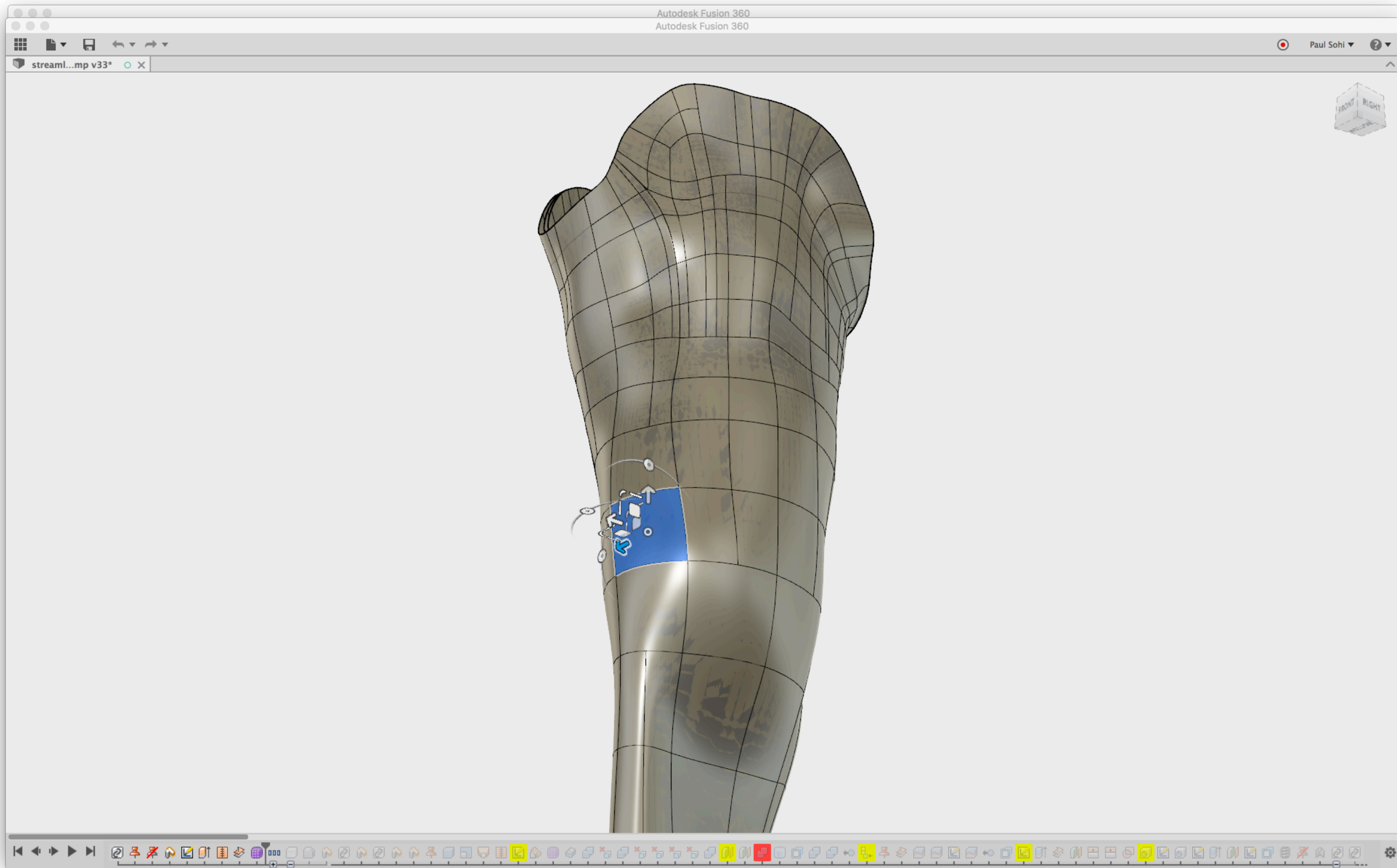
Never Stop Spinning

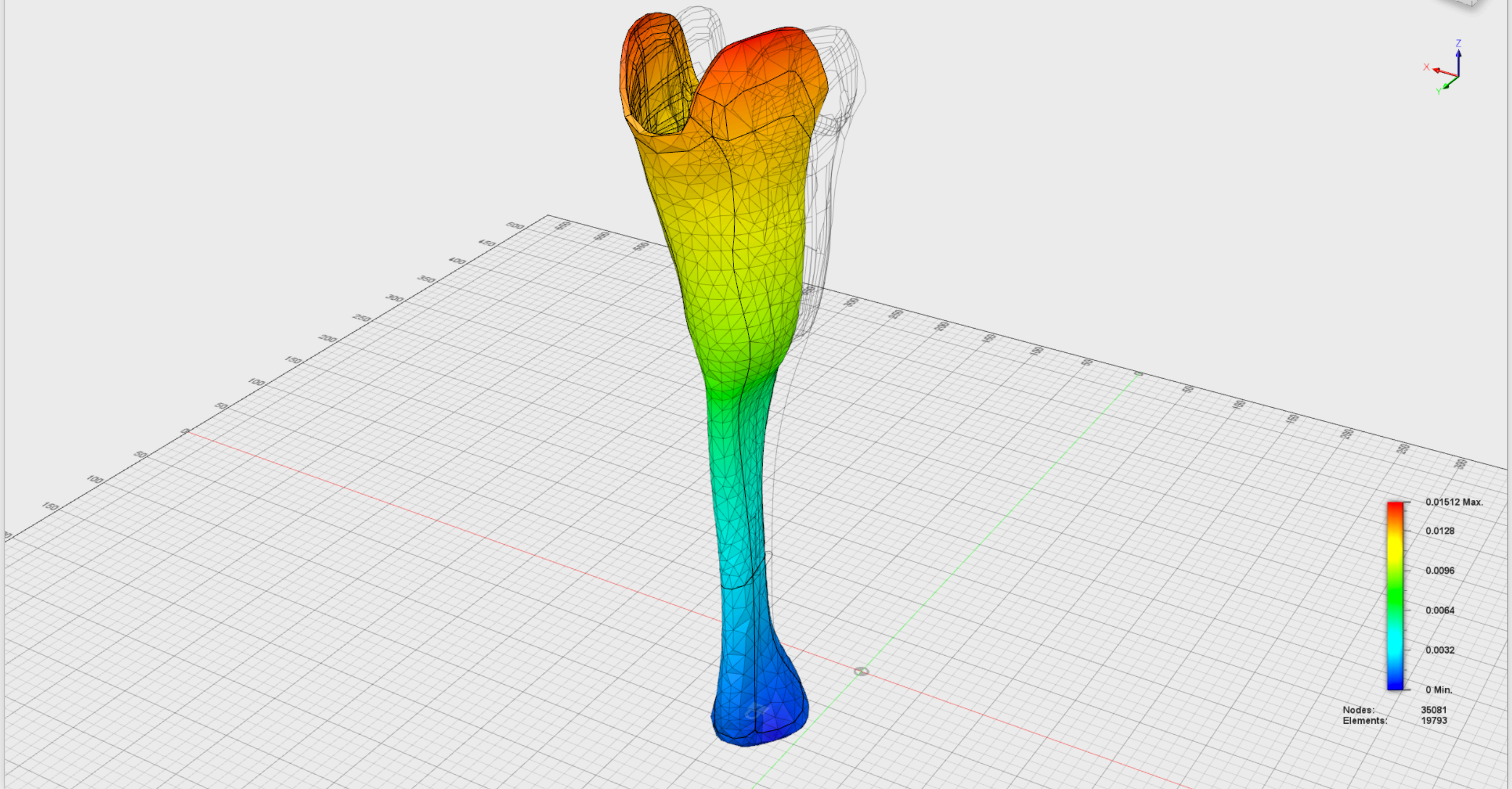
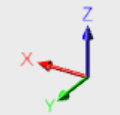












The Results

- 812GRAMS
- MANUFACTURED FROM BEGINNING TO END IN 48 HOURS
- LIGHTER AND AS STRONG AS THE CARBON FIBRE ONE







How did I do?

- Your class feedback is critical. Fill out a **class survey** now.
- Use the AU mobile app or fill out a class survey online.
- Give feedback after each session.
- AU speakers will get feedback in real-time.
- **Your feedback results in better classes and a better AU experience.**



