



Issues of Human Interface Design

Gary M. Berke MS, CP, FAAOP

Adjunct Clinical Associate Professor, Department
of Orthopaedic Surgery
Stanford University

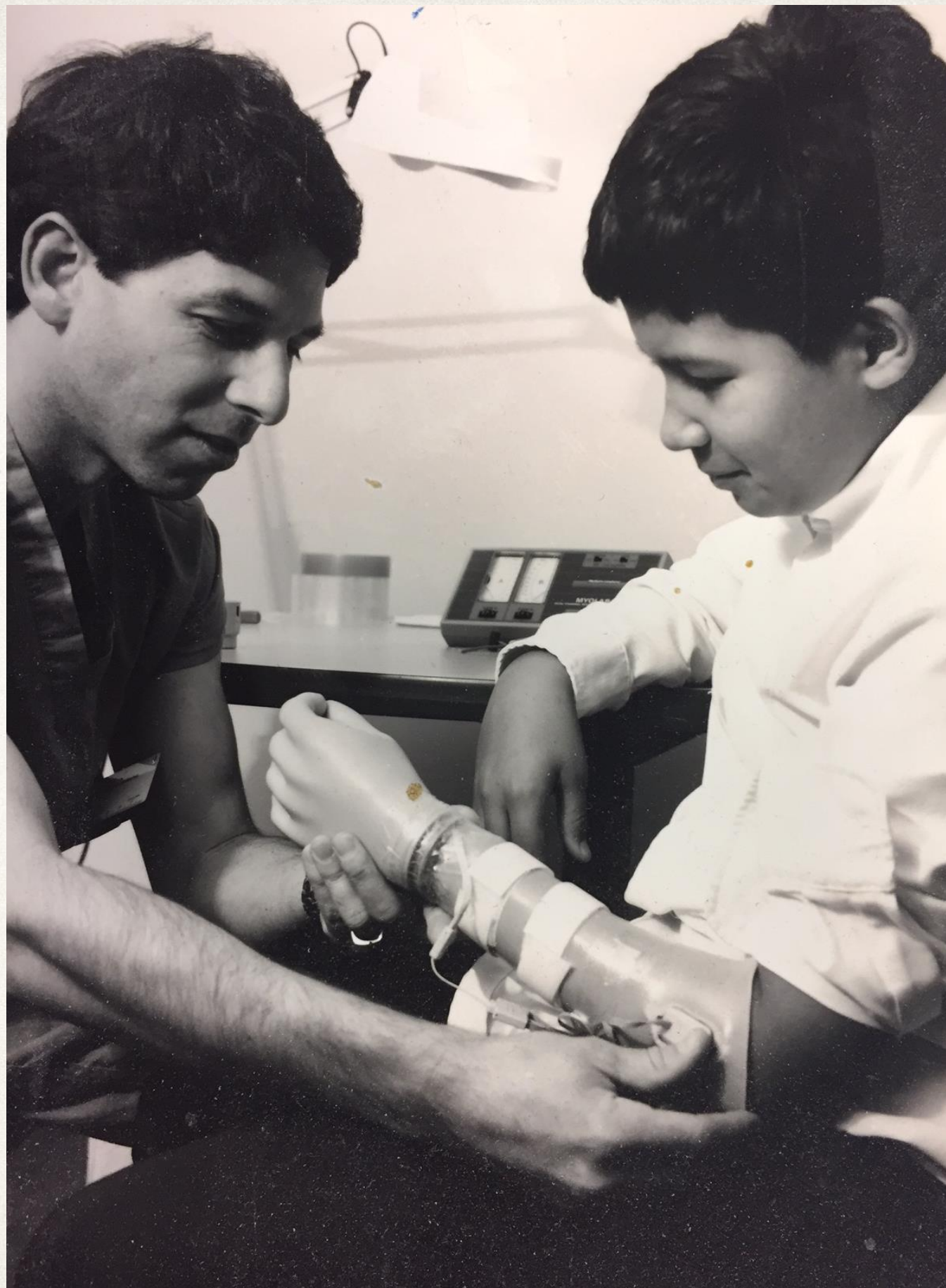
Private Practitioner, Berke Prosthetics/ Orthotics,
San Mateo, CA

Chief Clinical Officer,
Medical Creations LLC, Denver CO

Disclosures

- ❖ OPIE Software (Consultant)
- ❖ D-Rev Designs (Board of Advisors)
- ❖ National PI, Xtremity Socket Systems

The older I get the less I know.



This is Ron







This is Ron





Won the Battle but Lost the War

Winning a battle but losing the war is a military mental model that refers to achieving a minor victory that ultimately results in a larger defeat, rendering the victory empty or hollow.

SO WHAT DID WE MISS?

How do you design a shoe?



Five C's

- Comfort
- Cosmesis
- funCtion
- Cost
- Cool

Comfort

- ✱ What makes something comfortable?
 U_N
- ✱ Fluid dynamics, what happens when you add pressure to tissue?

Comfort

- ✱ Transference of pressure
- ✱ No “noxious” stimuli (noise, vibration etc)
- ✱ Heat
- ✱ Nuisance factor
 - ✱ easy to put on and take off
 - ✱ not too bulky
- ✱ Weight
- ✱ Sensitivity of skin or nerve

Comfort is elusive

- ✻ What may be “comfortable” one minute may not be the next.....

funCtion

- ✱ Is it a device that reliably does what it is intended to do?

funCtion

Is there a device that can do everything?







Cosmesis

What is cosmetic?



Cosmesis

- ✻ How do we perceive ourselves?
- ✻ How do changes to our body affect our perception of cosmesis?







This is Jane







bionic

❖ It is hard when the expectation of the patient is greater than the design can provide.



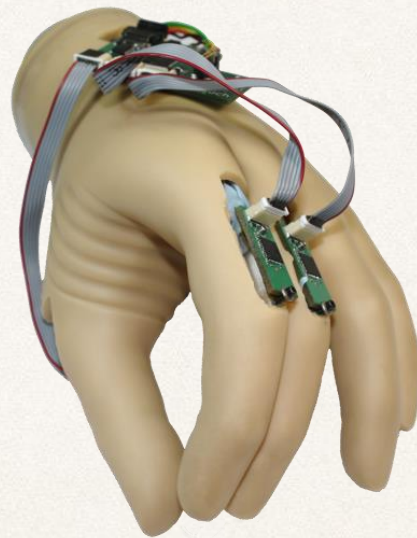
“Ya never know where somebody else’s shoes pinch”

Cost

- What is it worth to the consumer and...
- If it costs way more than standard care, does it
provide a proportional improvement in comfort, function, cosmesis?



What does a prosthesis cost AND what do we get paid?



The impact of who pays

On average, a dollar that people spend for themselves creates nearly 20 percent more satisfaction than a dollar that someone else spends on them.



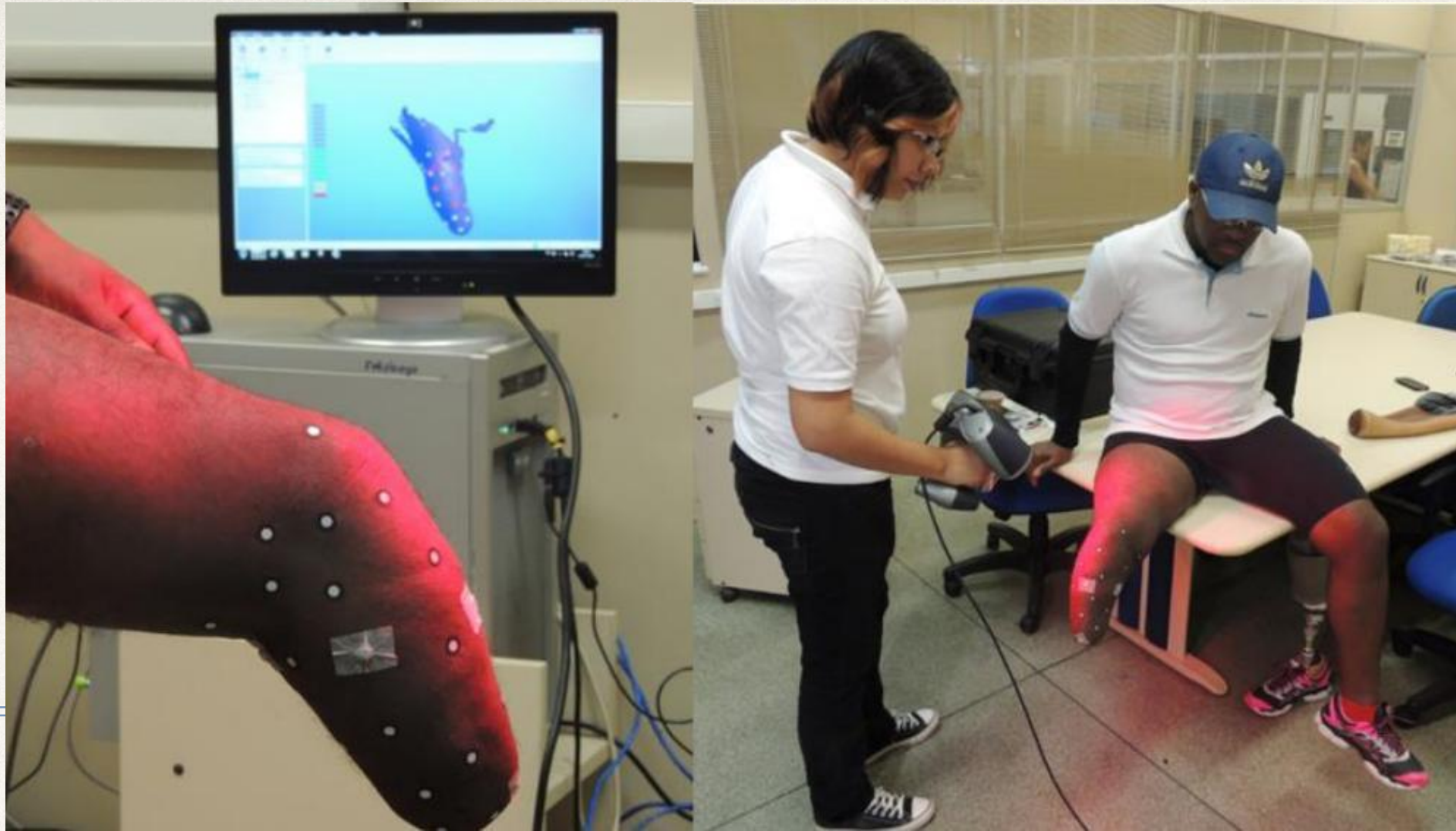
cool











I give you permission to be skeptical
with your optimism

How do “things”
interact with
humans?

glasses



Regular glasses

Self Adjusting

Comfort

✓

Function

✓

✓

Cosmesis

✓

Cost

✓

Cool

✓

Further.....

- ❖ There are people everywhere that use sticks to eat, perhaps we should 3-D print them forks.

OR

✦ Just because we CAN, doesn't mean
we SHOULD

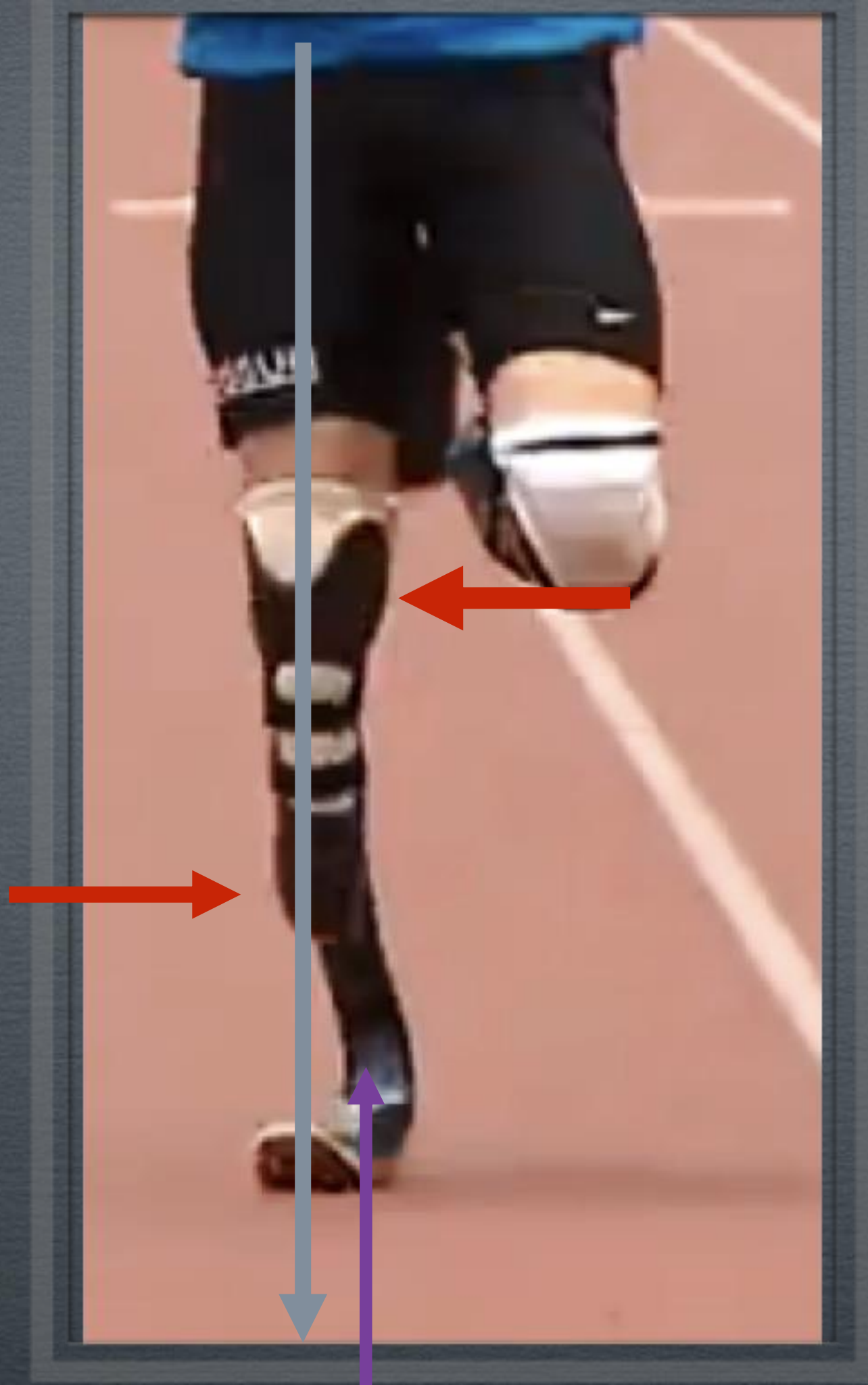


This is Riley



A prosthesis must fit intimately enough to comfortably support the limb during high loading, not bother the soft tissues and bone and transfer motion from the human to the device with extreme efficiency.





You can't start with the technology and try to figure out where you're going to try to sell it.

Steve Jobs



HUMAN?



