

Issues of Human Interface Design
or
Why Prosthetics is Different than
Robotics?

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[Oscar Pistorius puts his Cheetah Legs to the test](#) – 1:15

[Oscar Pistorius – The Blade Runner](#) – 3:06



Sub-sub title:

If we are faster with prostheses, why don't we all just cut off our legs?



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.







Where is the
pressure????





While robotics starts with a task to be completed or a problem to be solved.

We start with the person, their goals and their limitations.





So how do we insure the long-term success for the people we are supposed to help?



Given that everyone is different, are there some generalizations that can be made???

“Moments of Truth” in Interface Human Design

- What is a “Moment of Truth”?
- Independent but significant and often overlapping considerations for any device that will interface with a person.
- Failure at any one could destroy the long term success

Five C's

- **Comfort**
- **Cosmesis**
- **funCtion**
- **Cost**
- **Cool**

Comfort

- What makes something ^{UN-}comfortable?

Comfort

- Transference of pressure
- No “noxious” stimuli (noise, vibration, etc)
- Heat
- Nuisance factor
- Weight
- Sensitivity of skin or nerve







Cosmesis

- What is cosmetic?



Cosmesis

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







funCtion

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







bionic







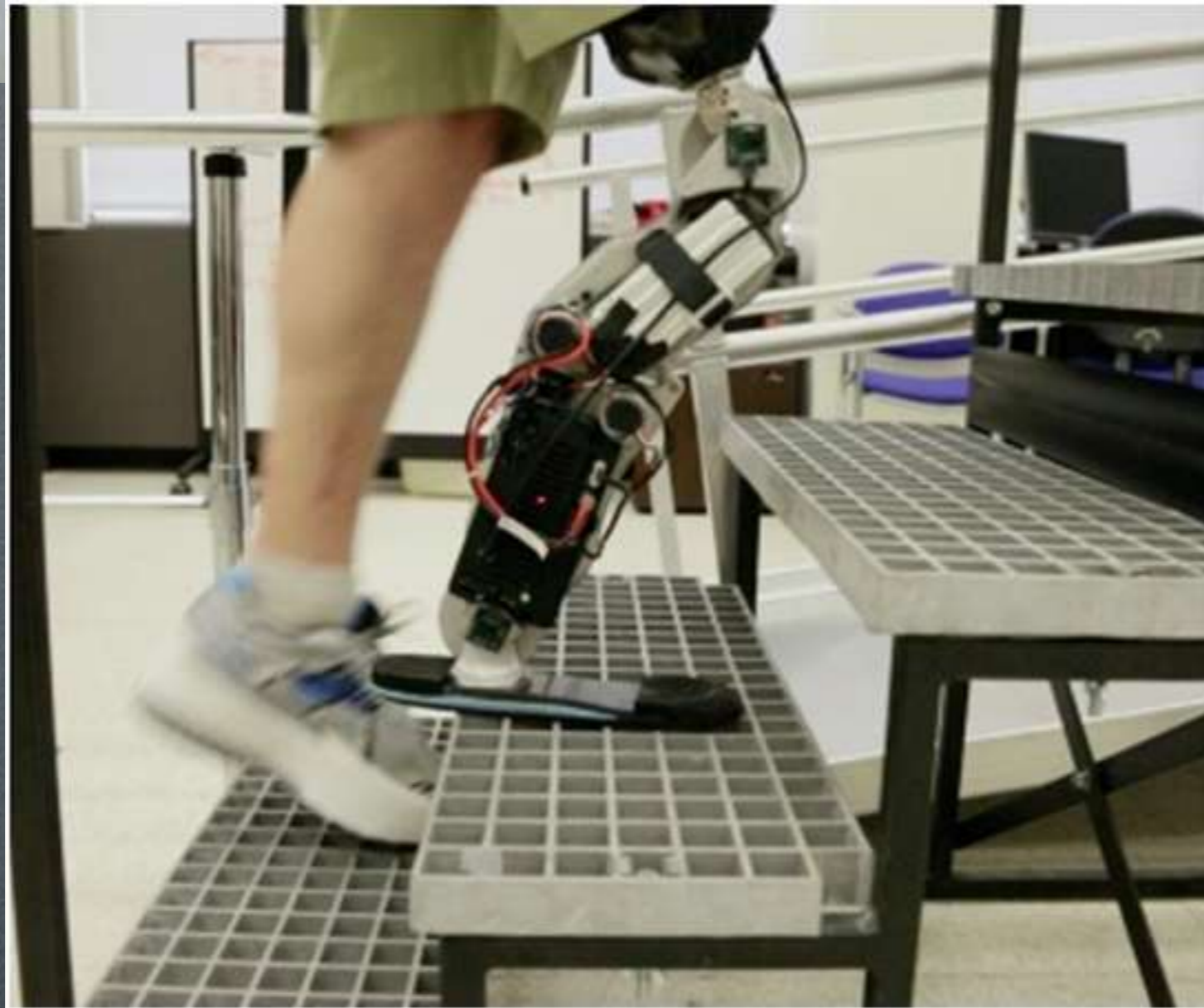


cool

We have a problem with technology

- We always want something new, often without formal training and **WITHOUT QUANTIFIABLE BENEFIT** and on some occasions, causing harm.

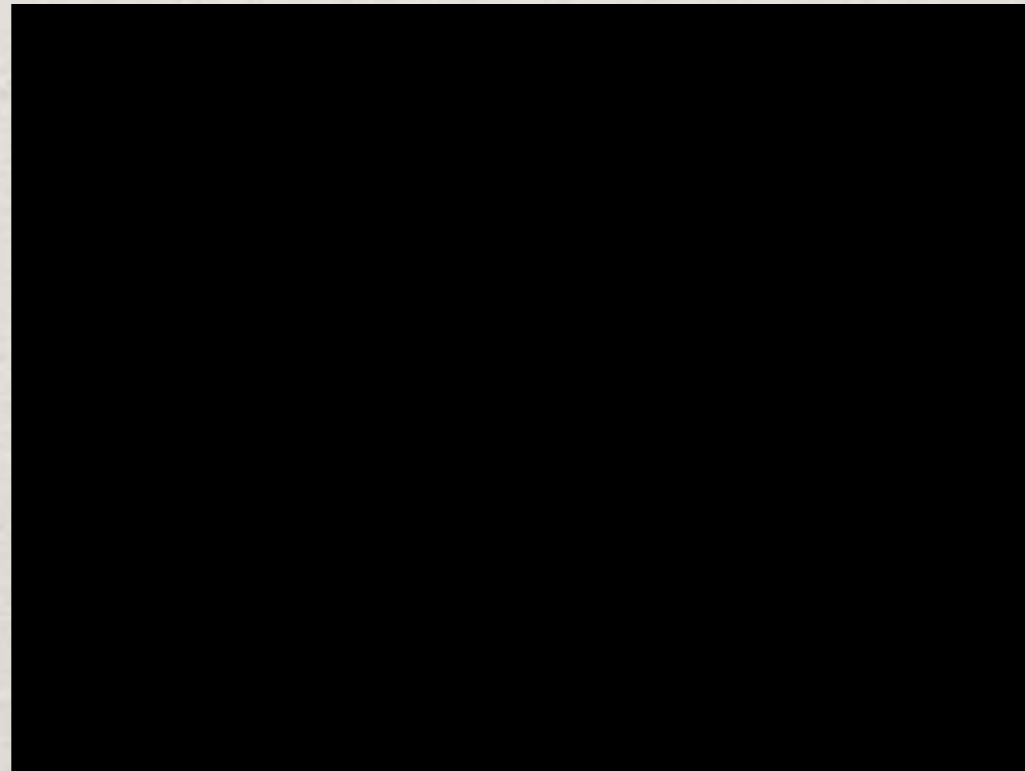






COST

Jesse Sullivan Video



27 degrees of freedom arm controlled by re-innervated muscle groups

There is a 6th 'C'

- CHANGE
 - Psychological change
 - Physical change
 - Yearly
 - Monthly
 - Daily
 - Hourly

The perfect
device is one
that balances
all of the above
for that
individual



Take home

- Critically evaluate what we do and why.
- Narrow your goals
- A prosthesis is not just a series of parts
- Just because you have a hammer, doesn't mean everything is a nail

