

The Ballad of Bionic Bodies

PREAMBLE (no music)

Today, I'd like to change your perceptions of cyborgs, and the bionic bodies of the future. Every time I talk to someone about these bionic people of the future, I see their mind turn immediately in fear to examples like the Terminator, or Doctor Octopus. And popular media has an awful lot of fun making these things very scary, but what if I told you that we're all already cyborgs, and humans have been for hundreds of years? Do we not use technology like clothing to augment our body's capability of keeping us warm? Do we not use glasses and contact lenses to enhance our natural vision capability? Since humans have been making technology, we've been using it to extend the capabilities of our bodies... the only difference now is that our technology is rapidly becoming more and more capable than ever before. Take for example the old memory augmentation technique of writing something down with a pen and paper. That's all been pretty much replaced by our computers and cell phones, which are capable of more than just augmenting our memory—but also of finding new information for us, or allowing us to send our thoughts and words across the globe in a matter of seconds. How's that for an upgrade? So for the last three or four years, I've been working in a lab here at the University of Alberta that's focussing on making a similar upgrade to prosthetic limbs. We're trying to move away from the old cable and hook style of arm replacement, toward something a little more intelligent, and hopefully a little more capable. And thus begins my Ballad of Bionic Bodies.

VERSE 1

F

Let's imagine now your robotic arm is a little more than metal;

C

Let's say it does some thinking on its own.

What if it could see the world and recognize its place,

F

And could help you write that cheque, or check your phone?

Yeah, what if it could sense the world and say, "Hey, I've been here before!"

C

And last time, you asked me to go like this <robot sounds>"

And so knowing what you planned to do, in the general context,

F

It could help you in positioning your wrist?

CHORUS

B♭

F

Well, then we'd be a little closer to a closer partnership

C

F

Of human and machine becoming one.

B♭

F

And when we learn together that's when we both become

C

F

Something greater than the parts or their sum.

INTERLUDE

Now, for those of you that came here looking for scientific rigor, facts, and the all-important citation... pay attention now, this next verse is for you.

VERSE 2

F

Ann Edwards et al. in 2016 made remarkable progress,

C

In an experimental adaptive switching task

Where a robot arm could understand where it was, within a space,

F

And so switch the joint controlled without being asked.

And this sped up task completion times by 20 per-cent

C

And reduced the need to give a signalled switch,

Which goes to show that putting some intelligence inside

F

Can make your robotic arm less of a... burden.

CHORUS

B♭

F

Well, that brings us a little bit closer to a closer partnership

C

F

Of human and machine becoming one.

B♭

F

And when we learn together that's when we both become

C

F

Something greater than the parts or their sum.

INTERLUDE

Now I can see some of you in the audience thinking to yourselves "that sounds pretty darn fantastic, but... who the heck is this guy? What's his contribution?" Well I'm glad you asked.

VERSE 3

F

Rooooooooobotic hands have made an awful lot of fantastic progress,

C

But there's very few among them that can feel;

Now why should we expect our arms to predict what they should do,

F

When their perception of the world is not ideal?

~BREAK~

I mean, you wouldn't expect a fantastic performance from a blindfolded air traffic controller, or an orchestra conductor with earmuffs, or an engineer... with a ukulele...

~END BREAK~

F

So I made a hand with lots of fancy sensors built right in,

C

So machines can see the world the human way

With position sensors, force sensors, and a camera in the palm

F

It's quite a HANDi Hand, you could say!

C

F

And now it's open-sourced on blincdev.ca

CHORUS

B♭

F

Well, it brings us a little bit closer to that closer partnership

C

F

Of human and machine becoming one.

B♭

F

And when we learn together that's when we both become

C

F

Something greater than the parts or their sum.

(repeat chorus, singalong)