

# Me, my neuroprocessor, and I: Preparing for a hybrid world

September 16 2014, by Jonathan Hines



People often use technology to supplement or replace parts of their bodies, but how much is too much? That is the topic of a presentation by Purdue professor Jenna Rickus at the upcoming Dawn or Doom conference. The conference, which will examine the role of several rapidly expanding technologies in society,

will be Thursday (Sept. 18) and is free and open to the public. Credit: Purdue University image

Around 500 B.C, the Greek historian Herodotus documented the first recorded use of an artificial limb after encountering a man with a wooden foot. In 2014 a paraplegic man kicked off the World Cup soccer competition by using a mind-controlled exoskeleton.

Humanity, in its steady march toward a cyborg future, has come a long way from peg legs.

Humans' increased capacity to comprehend and manipulate the environment and, in turn, themselves – from brain-controlled prosthetics to genetically engineered organisms to cultured meat grown in a lab – has long been the fodder of science fiction. Jenna Rickus, an associate professor of agricultural and biological engineering and [biomedical engineering](#), says several emerging scientific fields are rapidly turning those ideas into fact.

"We're starting to see this merging of the technological and biological world in interesting ways that's creating what I call a hybrid zone," Rickus says. "Synthetic biology, neuroengineering, nanotechnology and [artificial intelligence](#) are all approaching [synthetic life](#) from a different direction. The technologies produced by these fields have the potential to solve real problems, but they also raise some fundamental questions about the human experience."

Today, the division between living and non-living organisms (or humans and computers) is clearly demarcated. But as scientists continue to manipulate materials and organisms to fight disease, reduce humanity's environmental footprint and augment human abilities, among other

pursuits, the lines start to blur. If the Google Glass of the future connects to your optic nerve, is it still Glass or is it you?

"There are some fundamental questions we need to ask as a society," Rickus says. "What is life? What is human? What is synthetic versus natural? Many people feel strongly about these questions but can't explain why they feel the way they do."

Rickus, whose research focuses on controlling and engineering cells to treat conditions like epilepsy and Type 1 diabetes, will be exploring these questions in a lecture titled "Synthetic Life: Our Hybrid Future" during a Purdue conference called Dawn or Doom: The New Technology Explosion.

The Dawn or Doom conference is being held Thursday (Sept. 18) on the Purdue West Lafayette campus and is free and open to the public.

The benefits of biological systems made to be as easy to assemble as a circuit board are just beginning to have effects in the wider world. Researchers in California recently commandeered yeast cells to produce a malaria treatment at a fraction of the cost of extracting the drug from nature, creating a more affordable cure for the roughly 200 million people affected by malaria each year.

Other hybrid pursuits seem to be pulled straight from a Philip K. Dick novel: cyborg insects, 360-degree vision and Dr. Moreau-style creatures. Rickus says people shouldn't let the dystopian sci-fi scenarios scare them from coming to grips with the challenging problems these technologies present.

"What about genetic diversity?" Rickus says. "Are we going to weaken our species by manipulating our own genomes? To me, that's one of the bigger issues. We may not be as smart at developing evolutionary

advantages as nature."

Progressing toward a rational hybrid future may come down to how well scientists, policy leaders and the general public communicate.

"We've bought into this myth that technology is the force that shapes society's values and drives progress, and that's just not true," Rickus says. "It's society that drives technology. That's why it's important to have these discussions."

Provided by Purdue University

Citation: Me, my neuroprocessor, and I: Preparing for a hybrid world (2014, September 16)  
retrieved 19 April 2024 from <https://phys.org/news/2014-09-neuroprocessor-hybrid-world.html>

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