



Europe

Financial Times Europe
SE1 9HL London
+44 (0) 20 7873 3000Medienart: Print
Medientyp: Publikumszeitschriften
Auflage: 87'199
Erscheinungsweise: 5x wöchentlichThemen-Nr.: 999.051
Abo-Nr.: 1086740
Seite: 9
Fläche: 25'209 mm²

Olympian achievements beckon for robotic limbs

Perfectly honed bodies, controlled by perfectly composed minds, will tomorrow officially begin living the motto of the Olympic Games: *citius, altius, fortius* (faster, higher, stronger). Such is the extreme physical aptitude on display that sofa-bound spectators might be left wondering whether Olympians are some kind of alien superspecies.

The sentiment is misplaced: an average, functioning human body is itself a masterpiece of engineering, a fact most apparent when things go wrong. That sofa-bound spectator – let us imagine her with her feet up enjoying tea and a biscuit – is unwittingly accomplishing feats of motor control and co-ordination that are almost impossible to replicate using robotics. Scientists who develop prostheses struggle to make artificial limbs that work as well as their natural counterparts. This is the challenge that underpins an alternative Olympic-style event taking place in Zurich in October.

The Cybathlon, billed as the first cyborg Olympics, is no faux Paralympics: the stars will be the cutting-edge assistive technologies on display, not the humans to which they are attached. Aspiring cyclists, for example, will pedal by having their muscles electrically stimulated. By contrast, Paralympians compete under their own muscular

steam, using only commercially available devices.

At the Cybathlon more than 80 research groups drawn from 25 countries will battle it out at Zurich's ice hockey stadium. It is not the usual sporting fare. Competitors vying in the prosthetic arm event will prepare a meal and hang washing on a line. Those in the prosthetic leg event will navigate stairs, uneven floors and doorways.

Perhaps the most unusual event, reports the journal *Nature*, is a test of brain-computer interfaces: 15 competitors will try to move a screen character with their minds (or, rather, with brain activity). Three distinct manoeuvres – accelerate, jump and roll – are needed to complete the onscreen obstacle course, with each move requiring a specific pattern of brain activity.

Similar technology could eventually allow paralysed individuals to guide wheelchairs using thought alone. This year, researchers in the US showed that monkeys implanted with brain devices could control a wheelchair in this way.

The Cybathlon is the design of Professor Robert Riener, a biomedical engineer at the Swiss Federal Institute of Technology in Zurich, who wanted to make people aware that while life-changing technology exists in the laboratory it was not reaching those who needed it.

He considered organising stunts such as mountain climbing with prosthetic limbs but changed his mind after realising it was ordinary activities that wearers of prosthetic limbs found most challenging. For example, mimicking the incredible strength and flexibility of human fingers – which can both crush a can and hold an egg without breaking it – has for decades been the dream of biomedical engineers. Yet many artificial hands still largely comprise hooks and cables.

One company feeling its way to success is Open Bionics, a crowd-funded start-up that uses 3D printing to make relatively cheap, advanced artificial hands that can grip eggs.

The Cybathlon does exactly what technology competitions are supposed to do: it attracts big players while winking out smaller outfits flying under the radar. There is already a buzz around one competitor's cut-price 3D-printed exoskeleton with windscreen-wiper motors for joints. Contests also encourage engineers to push their not-quite-perfect creations out of the lab and into the real world. There are nearly 2m amputees in the US alone, and millions more worldwide who have lost limbs to cancer, diabetes, trauma and war. They want progress, not perfection.

The writer is a science commentator

