Medical Xpress

Technology has helped para athletes compete for decades—but it can also create an unfair advantage

August 30 2024, by John Cairney, Emma Beckman and Sean Tweedy

Credit: Pixabay/CC0 Public Domain

The Paralympic Games, now a major global event, has a history rooted

in rehabilitation.

The first official Paralympic Games was held in Rome in 1960. But its origins trace back to 1948, when neurologist Ludwig Guttmann organized the Stoke Mandeville Games in England for World War II veterans with spinal cord injuries. He believed sport could play a powerful role in rehabilitation, pushing the boundaries of human performance in ways other approaches could not.

Today's Paralympic Games continue this legacy, with technology playing a central role in these achievements.

Technology has enabled athletes with disabilities to reach incredible heights. However, it has also introduced new challenges, particularly in ensuring fairness and equity in competition.

From simple to sophisticated

In the early days, Paralympic technology was basic by today's standards. Athletes competed in regular wheelchairs and used simple strapping to assist.

As the Paralympic Games grew, competitive success became increasingly prized. As a result, athletes used specialized technology to gain a competitive edge.

Running blades, for example, are carbon fiber prosthetics designed to mimic natural leg movement while enhancing speed and bounciness. These blades have revolutionized track events. They enable athletes with lower-limb amputations to compete at speeds comparable to, and sometimes even faster than, able-bodied athletes.

South African sprinter and convicted murderer Oscar Pistorius was the

first double amputee with running blades who competed in the London Olympics in 2012 as part of the men's 4x400 relay.

A shifting conversation

By the end of the 2010s, however, the conversation about assistive technology used by athletes had shifted from celebrating integration to debating unfair advantage.

In 2019, Blake Leeper, a bilateral amputee sprinter, applied to World Athletics to compete in the 2020 Tokyo Olympics against able-bodied athletes. The international governing body for athletics received independent scientific advice that Leeper's prosthetics gave him a competitive advantage and rejected the application.

Leeper contested this decision in the Court of Arbitration for Sport. But the court ruled against him.

Leeper, who is African-American, appealed the decision on the grounds the scientific advice provided to World Athletics was based on racially prejudiced science. But the court rejected his appeal. It ruled the evidence to be fair and unbiased.

As technology continues to advance, running blades may soon seem modest compared to what the future brings.

Neuroprosthetics are a notable example. These are devices that interface with the human nervous system to overcome losses in muscular strength and endurance that result from neurological impairments such as spinal cord injury.

The devices can be attached externally or surgically implanted. They can improve functions such as sitting stability and rowing machine

performance.

It's not hard to imagine some athletes using these devices to gain a significant—but possibly undetectable—advantage over competitors.

The International Paralympic Committee has a sports equipment policy. One of the principles is that sports performance should be determined primarily by human performance, and the effect of technology and equipment should be secondary.

However, upholding this principle requires enforceable rules. As technology advances, this will become increasingly challenging—just as it is in the Olympics.

Leveling the playing field

Technology can also play a crucial role when it comes to classifying athletes.

Each of the 22 Paralympic sports uses a classification system to ensure competition is fair and meaningful. Each athlete is classified according to the type and severity of their impairment.

However, classification is not without its challenges.

Despite significant research advances, the best and most valid processes available still rely on expert judgment. And even when classifiers follow strict guidelines, there is an incredibly wide array of test results for classifiers to consider.

Many classification tests also require athletes to give a full effort. This leaves open the possibility an athlete wishing to gain an unfair competitive advantage might deliberately underperform on these tests to

exaggerate their impairment severity. They might then be placed in a class of athletes with more severe impairments.

To address these challenges, we are part of a research team that is currently developing an artificial intelligence-driven classification system.

We will use computer vision of para athletes performing a wide array of movements over time to train the system and develop an app. The app will allow athletes anywhere in the world to video themselves performing sports-related tasks, submit the video and receive an accurate, objective sports class.

This will make classifications more trustworthy and will improve access for athletes in rural and remote areas or developing countries.

However, the diversity of para athletes is enormous and the process of recruiting and filming a representative sample of high-level para athletes will not be easy. The system also can't fully protect against athletes deliberately under-performing. But it is able to detect variations in performance that occur over time which would not otherwise be detectable to the human eye.

This will give greater confidence in the accuracy of the athlete's classification.

Once the system is developed, its success will also depend on gaining the trust of the whole Paralympic community.

Using technology to gain an unfair advantage is as old as sport itself. But technology is also the very tool we must use to ensure fairness and to level the playing field.

Provided by The Conversation

Citation: Technology has helped para athletes compete for decades—but it can also create an unfair advantage (2024, August 30) retrieved 1 September 2024 from https://medicalxpress.com/news/2024-08-technology-para-athletes-decades-unfair.html