Badminton-playing robot tests software designs of the future

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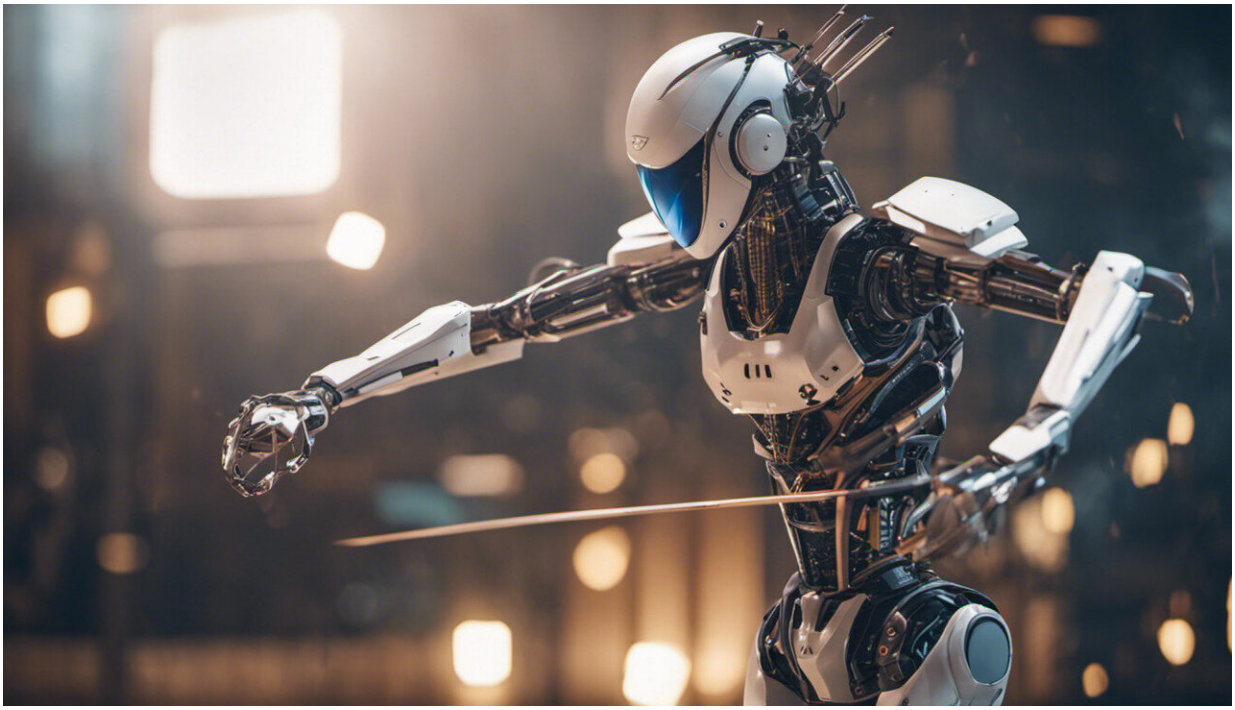

Credit: AI-generated image (disclaimer)

The drive to decrease the ecological impact of production machines is leading manufactures to focus on novel ways to incorporate energy efficiency in the designing of new products. One answer is the first-ever badminton playing robot - designed to test a software application that optimises energy efficiency in machine design.

The robot is the result of the ESTOMAD project ('Energy Software Tools for Sustainable Machine Design'), led by the Flanders' Mechatronics Technology Centre (FMTC) in Belgium. They have been looking at design approaches within sectors, such as agriculture and textiles, that are driven by performance and capacity, rather than energy efficiency. So the main goal of the project, with EU-funding of nearly EUR 2 million, has been to develop a methodology and related ICT tools to model, simulate, analyse and optimise energy flows and losses throughout the whole machine.

Wim Symens, Technical Director of Flanders' Mechatronics Technology Centre says, 'We decided to build a badminton robot to demonstrate the new technologies we are developing. The reason we decided on a badminton robot is that we thought it would be a really convincing demonstrator; a real eye catcher. There has never been a badminton robot, and everybody can play against it.'

He adds, 'We were able to cut down the energy consumption of the robot by 50 %.'

What the team found from observing the robot was that energy consumption of installed machines can be incrementally reduced by punctual modifications, such as replacing standard electric motors with high efficiency alternatives.

With new design schemes developed by the ESTOMAD team, machines are expected to have an average energy saving of 30 % over their lifespan. It is expected that the newly adapted technology will also help the car industry. This approach has previously been employed for products such as refrigerators and laundry machines.

Industry has already expressed interest in performing this type of energy efficiency analysis. For example, one of the eight partners involved in

the project is Picanol, specialised in high-tech weaving machine construction. It has reportedly cut the energy consumption of its existing machines by up to 15 % by integrating the ESTOMAD software into its production line.
The ESTOMAD team believe that in the future engineers could use this software for machines even before they are built. Performing a virtual analysis at an early stage, they say, could provide a competitive advantage to industry.

Tom Boermans of engineering solution consultancy LMS International, Belgium, another partner in the project, says, 'A virtual approach is always the preferred one. You can even simulate strange conditions; very fast or very high temperatures. In real life, those tests are very expensive.'

It is thought that the badminton robot and the innovative software will help engineers of many different industries to cut down the energy consumption of their production line, making production more sustainable while reducing the costs of their end products.

More information: ESTOMAD www.estomad.org/

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