TOffeeAM's technology is used by companies such as Boeing | Photo source Unsplash

USING AI FOR SUSTAINABLE ENGINEERING

MANUFACTURING

An Imperial College London spinoff has developed AI that can design sustainable additive manufacturing machines

Spotted: The manufacturing and production industries are responsible for one-fifth of the world's carbon emissions. Working to push the boundaries of green engineering and cut back on this production of carbon gases is TOffeeAM (Topology Optimisation For Fluids engineering and Additive Manufacturing), a spinoff from Imperial College London. TOffeeAM uses an artificial intelligence (AI) algorithm called TOffee to design more sustainable additive manufactured parts, which can then help to reduce the carbon footprint of companies.

The company points out that industries that adopt additive manufacturing in their production lines often continue using old component designs, reducing some of the benefits they could be getting from the new machines. In response, it has built TOffeeAM – an 'automated multiphysics generative design platform'. The user inputs design space, fluid or material conditions and properties, and the type of performance that needs to be optimised – from heat exchange to pressure losses.

Once the parameters have been inputted, TOffee uses a process of multiphysics generative design and AI to create the optimum design for the specific engineering component. This software will optimise the fluid/structure topology, the weight, and materials used, generating the most sustainable and efficient design solution from scratch.

The startup has recently raised £5 million (approximately €5.8 million) in a Series A funding round led by Presidio Ventures Europe and East Innovate IQ Capital. The money will be used partly to scale up the technology. In a press release, Francesco Montomoli, TOffeeAM CEO, said: "This funding will give

TOffeeAM the opportunity to scale globally and continue to help businesses across numerous industries to design innovative products."

Springwise has spotted other innovations in additive manufacturing, such as bee-sized 3D-printed drones that can deposit materials in flight, and 3D-printed electronics.

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Takeaway:

With production sectors consuming 54 per cent of the world's energy resources, the need to make engineering and manufacturing processes more efficient is critical. TOffeeAM represents a game changer in the field of engineering design. According to the company, the smart design platform can replicate the work of highly trained human engineers, only faster and at a lower cost. If successful, this could be a first step in replacing the expensive 'trial and error' approach to design with AI. TOffeeAM will make it easier to create hyper-efficient, lightweight, low-waste designs, while increasing reliability and overall performance.