



ORIGAMI MADE OF POLYMERS

Scientists have developed a composite polymer to 3D print self-folding structures.

At the CHI 2018, a conference held in Montreal, Canada, a team of scientists from the USA, China and Austria showcased their new development – a composite polymer material for 3D printing. The material proves to be unique as it enables flat elements to self-fold into 3D structures of a required shape when heated. The novel technology will bring major savings in 3D printing time and costs.



3D printed self-folding rose made of PLA and TPU.

TWO POLYMERS WERE USED FOR PRINTING – POLYLACTIDE (PLA) AND THERMOPLASTIC POLYURETHANE (TPU).

As an example, the scientists demonstrated several 3D models, including self-folding figures of a rose and a bunny. Two polymers were used for printing – polylactide (PLA) and thermoplastic polyurethane (TPU). PLA, a thermoplastic that expands when heated, is used as the basis, while TPU helps to fix and shape PLA.

To determine the shape of the structure to be 3D printed and to then create the target model, and as a way to understand the right sequence of PLA and TPU blocks, the scientists developed a particular algorithm. It shows what sections the flat printout needs to have in order to self-fold correctly when heated.

How the algorithm for self-folding structures work.