



## 3D printing

In the past few years 3D printing has been used to create some amazing things that we probably couldn't have imagined to be possible. In fact, this technology has been used to 3D print cars, whole houses, food, custom medications, consumer products and soon there will even be 3D printed living tissue. What is really amazing about 3D printing is the vast applications that it can have, and each one of them requires its own technology and research to perfect and get right. What is even more incredible is the sheer number of uses for 3D printing that are still being developed and perfected.

While there has been plenty of 3D printed clothing, for the most part there have been few or no practical applications yet. That doesn't mean that there hasn't been much research into wearable 3D printed clothing and fabrics, but there are still some problems to be solved in the process. Primarily 3D printed fabrics and textiles are printed using a selective laser sintering process because it offers the highest level of detail needed to produce movable materials that can be turned into clothing. Unfortunately the detail still isn't fine enough to make practical clothing, but the research has produced some innovative and smart geometries that could eventually be scaled down into lightweight and wearable 3D printed fabrics.

A new joint research project from the UK's Loughborough University is trying to take 3D printed textiles from concept to wearable. They hope their research can ultimately change the way that clothing is designed, manufactured and worn. The 18-month project is called 3D Fashion and the goal is to produce finished, ready-to-wear clothing directly from raw materials in a single manufacturing operation. The ultimate goal is to create a 3D printing process that can be commercialized and used to manufacture customized clothing using polymer materials.

Traditional clothing manufacturing is incredibly wasteful and environmentally damaging. China still produces most of the world's textiles, and in 2010 alone it processed more than 41 million tons of fibres. Unfortunately, that year they also produced three billion tons of air pollution, millions of tons of wasted fabric material and each individual mill used an average of 200 tons of water for each ton of fabric that was dyed, producing more than two and a half billion tons of waste water. But 3D printing can virtually eliminate all of that pollution, while also encouraging more localized clothing manufacturing and production.

Not only can 3D printed clothing dramatically reduce waste, pollution, labour costs and CO<sub>2</sub> emissions, but it can also be used to produce completely personalized garments, without adding any additional costs to the process. Because it doesn't cost more to 3D print objects with varying geometries, new clothing manufacturers could use modern, 3D scanning technology to create customized clothing that is made specifically for the wearer's body.



### ACTIVITIES

1 Read the text and decide whether the following statements are true or false.

- 1 3D technology has never been used to print cars.
- 2 There have been few or no practical applications of 3D printed clothing so far.
- 3 There hasn't been much research into wearable 3D printed clothing and fabrics.
- 4 3D printed fabrics and textiles are printed using a selective laser sintering process.
- 5 In 3D printing the detail isn't large enough to make practical clothing.
- 6 3D clothing manufacturing is incredibly wasteful and environmentally damaging.
- 7 A lot of pollution in China was the consequence of clothing production.
- 8 3D printing can also encourage more localized clothing manufacturing and production.
- 9 CO<sub>2</sub> emissions can be reduced by 3D printing clothes production.
- 10 Clothing cannot be customized by using 3D printing.

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