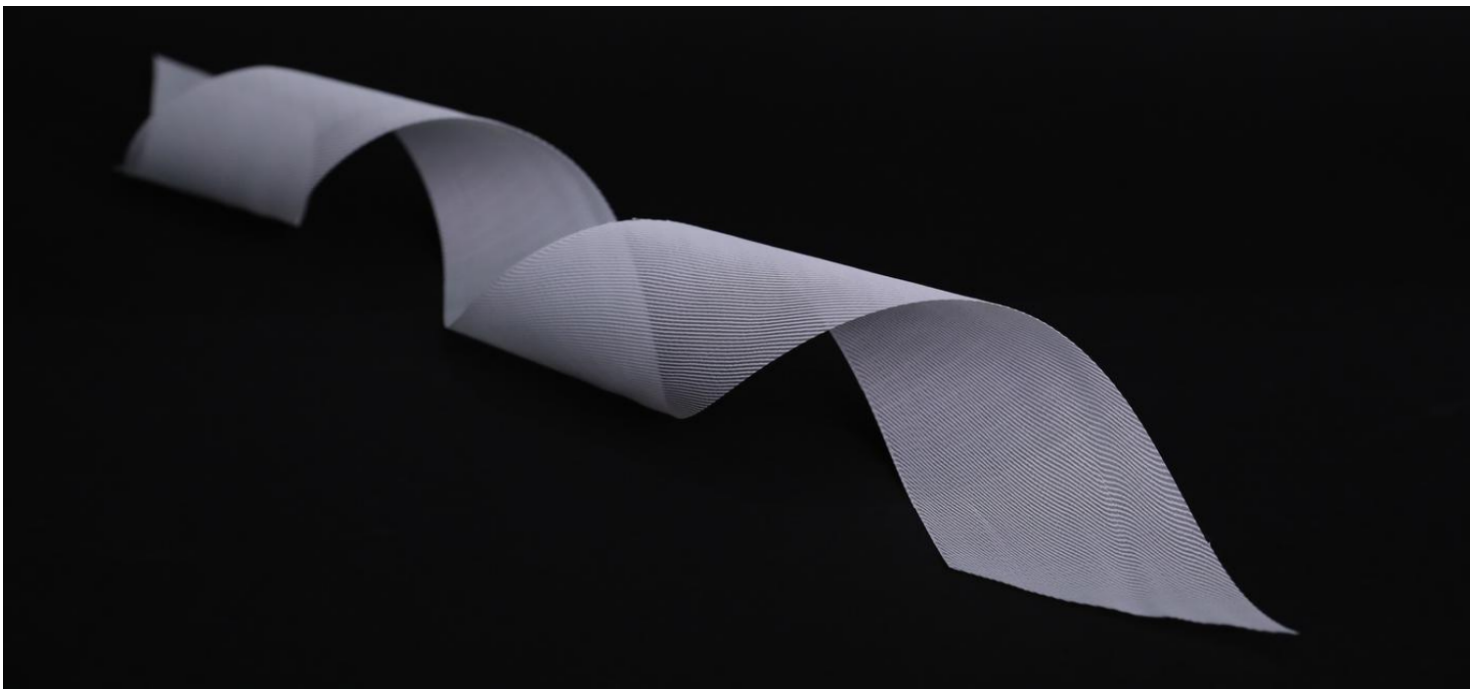

3D printed DefeXtiles are made from cornstarch-based biodegradable plastic. | Photo source MIT

NEW 3D-PRINTED FABRIC REDUCES FASHION WASTE

SCIENCE

Thin and stretchy, the fabric can be printed for a bespoke fit

Spotted: Students at the Massachusetts Institute of Technology have created DefeXtiles, 3D-printed tulle-like materials made from cornstarch-based biodegradable plastic. In addition, the project leverages a regularly occurring design flaw in 3D printing, known as under-extrusion, as a key aspect of the materials.

Under-extrusion results in a 3D print with gaps and is thus generally viewed as a defect in 3D printing. The designers of DefeXtiles have developed a process that works with this phenomenon to rapidly and inexpensively 3D print thin and flexible “quasi-woven” textiles which look and feel similar to tulle. According to the designers, this approach enables a 3D printer to produce 70 metres of fabric in a single print.

At less than 0.4 milimetres in thickness, the lightweight and stretchy fabric can be densely printed and packaged. The designers also note its potentials for revolutionising fashion design, consumption and waste. The fabric is ideal for costume and fashion designers to experiment with ideas without creating huge amounts of waste. And in commercial sales, such test garments could provide shoppers with a realistic sample of a style as well as provide customisable options for personal fittings.

The printing process appears to be incredibly versatile. It can print more rigid versions of the fabric for use in badminton shuttlecocks, which require strength as well as minimal weight. It can also produce lace-like versions of the fabric as well as options that include sensing capabilities.

Future applications might extend into healthcare with customised meshes for surgical use as well as smart home accessories that react to touch and other inputs. Similar wearables Springwise has

recently spotted include a screen-printed e-textile that can power small devices and biodegradable heat therapy patches that mimic plant leaf designs.

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Takeaway:

Sensing fabrics are making wearable devices more flexible in both form and use. Being able to incorporate real-time, continuous monitoring of various health markers help both patients and physicians, and athletes are already expressing interest in developments for detailed tracking of performance. As materials improve in strength, flexibility and comfort, other applications of the fabrics could become viable, including a number of surgical uses. Finding ways to use the latest versions for prevention could also help to reduce common diseases and illnesses that are on track for eradication.