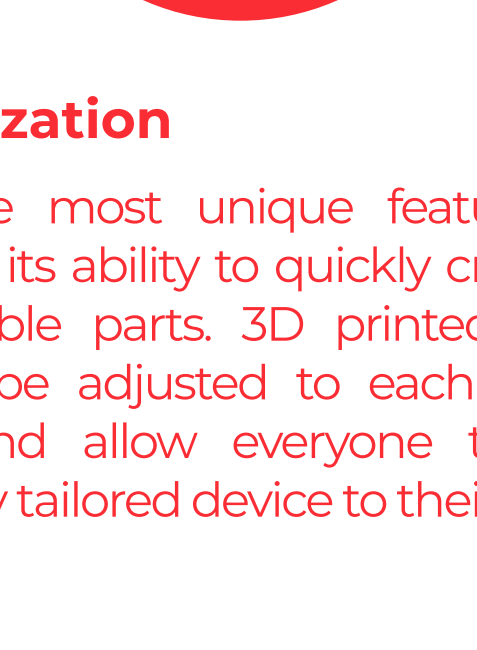


3D PRINTING FOR ASSISTING WITH DISABILITIES

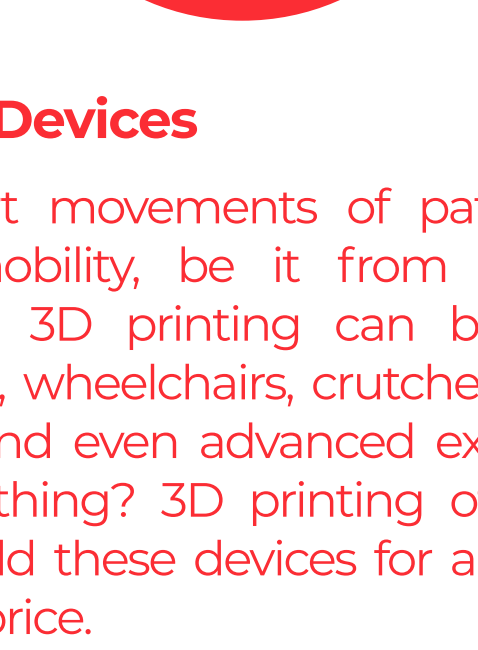
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WHY IS 3D PRINTING BEING USED FOR ASSISTING WITH DISABILITIES?



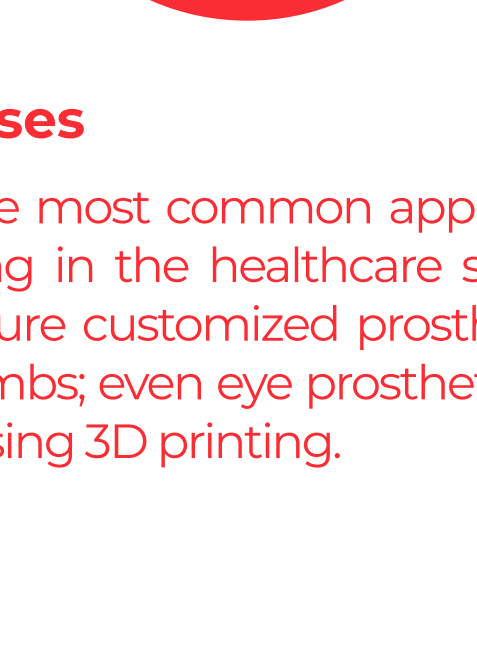
Customization

The single most unique feature of 3D printing is its ability to quickly create easily customizable parts. 3D printed disability aids can be adjusted to each individual patient and allow everyone to have a specifically tailored device to their person.



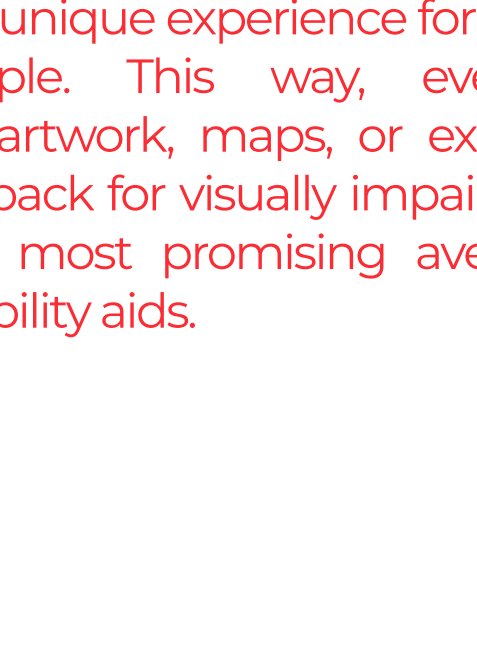
Mobility Devices

To support movements of patients with limited mobility, be it from injuries or disabilities, 3D printing can be used to create, e.g., wheelchairs, crutches or crutch handles, and even advanced exoskeletons. The best thing? 3D printing often allows you to build these devices for a fraction of the usual price.



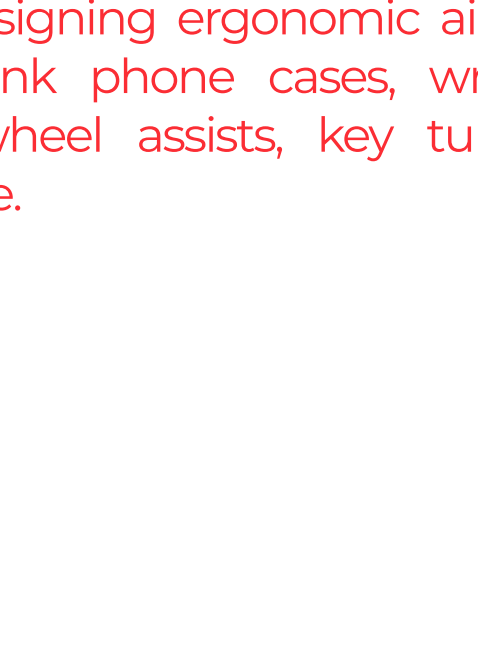
Prostheses

One of the most common applications of 3D printing in the healthcare sector is to manufacture customized prostheses. And not just limbs; even eye prosthetics can be created using 3D printing.



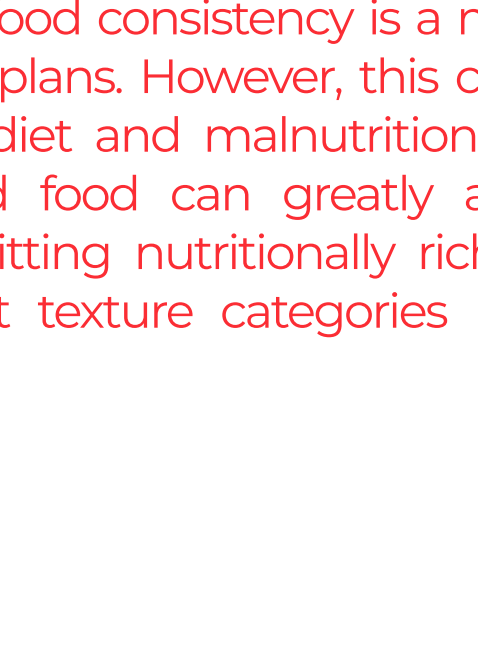
Aids for blind and low-vision people

3D printing is already being used in museums to provide a unique experience for blind or low-vision people. This way, everyone can experience artwork, maps, or exhibits in full. Haptic feedback for visually impaired people is one of the most promising avenues of 3D printed disability aids.



Ergonomic Aids for Everyday Life

Whole communities have sprung up around designing ergonomic aids for free online. Think phone cases, writing aids, steering wheel assists, key turners, and many more.



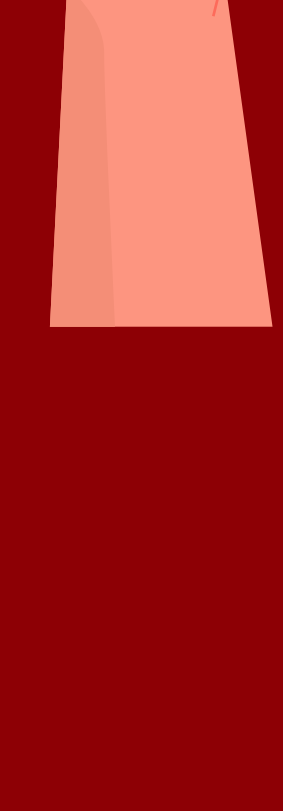
Eating

For people suffering from dysphagia, changing food consistency is a major part of treatment plans. However, this can lead to a restrictive diet and malnutrition in patients. 3D printed food can greatly alleviate this problem, fitting nutritionally rich foods into the correct texture categories provided by experts.

3D PRINTED ASSISTIVE DEVICES FOR PEOPLE WITH DISABILITIES

SONOVA HEARING AIDS

"Mass produced customized products" - that's the tag line behind one of the leading manufacturers of hearing aids, Sonova. The company has long embraced 3D printing and uses the technology to produce custom shells for in-the-ear hearing aids. Behind-the-ear and receiver-in-canal hearing aids are also manufactured using 3D printed parts.

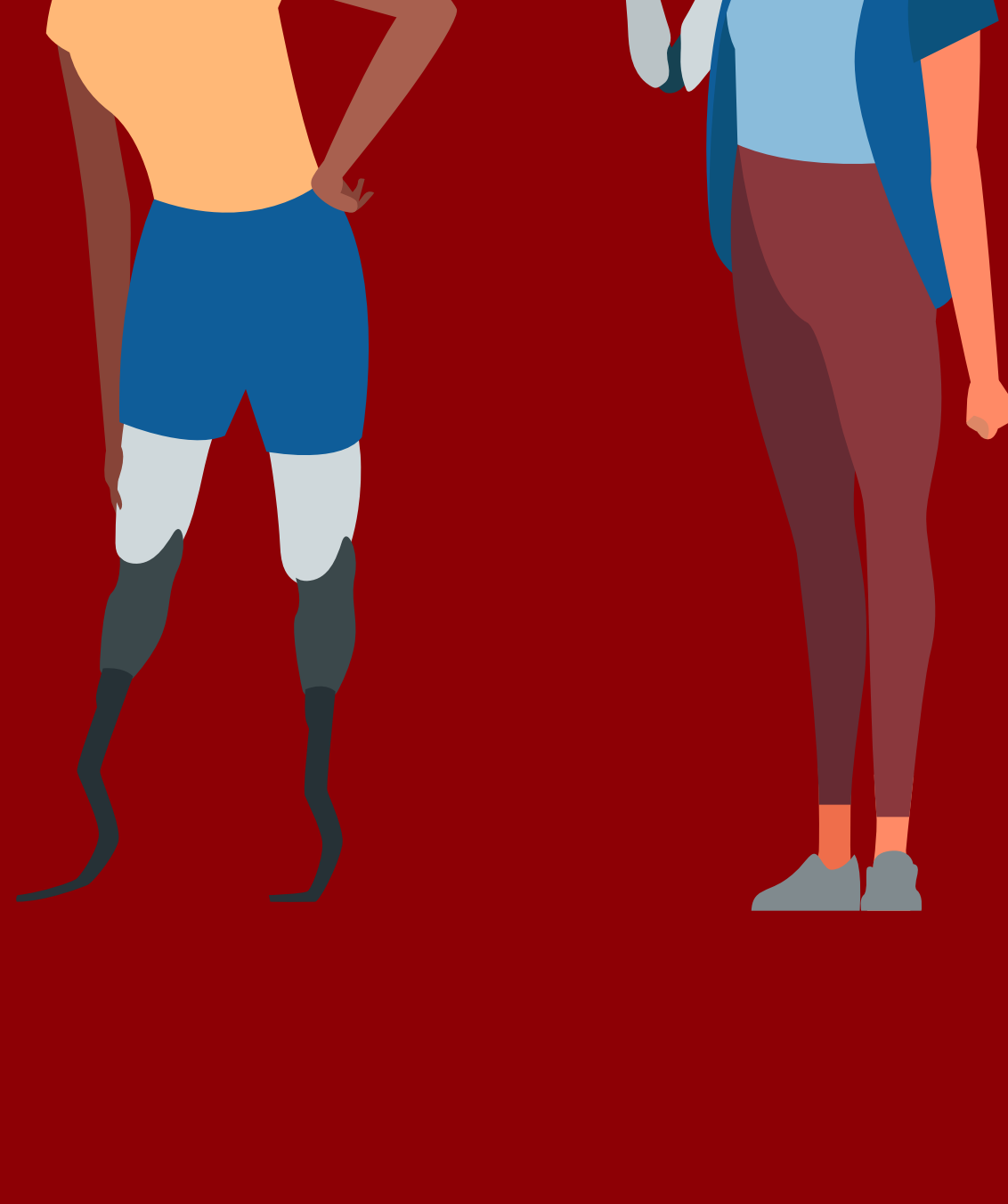


SHAPEWAYS ADD-ONS

Microsoft partnered with 3D printing expert Shapeways to create custom made accessories for Microsoft products in partnership with the disabled community. For example, they designed custom mouse tails and button toppers for people with limited dexterity.

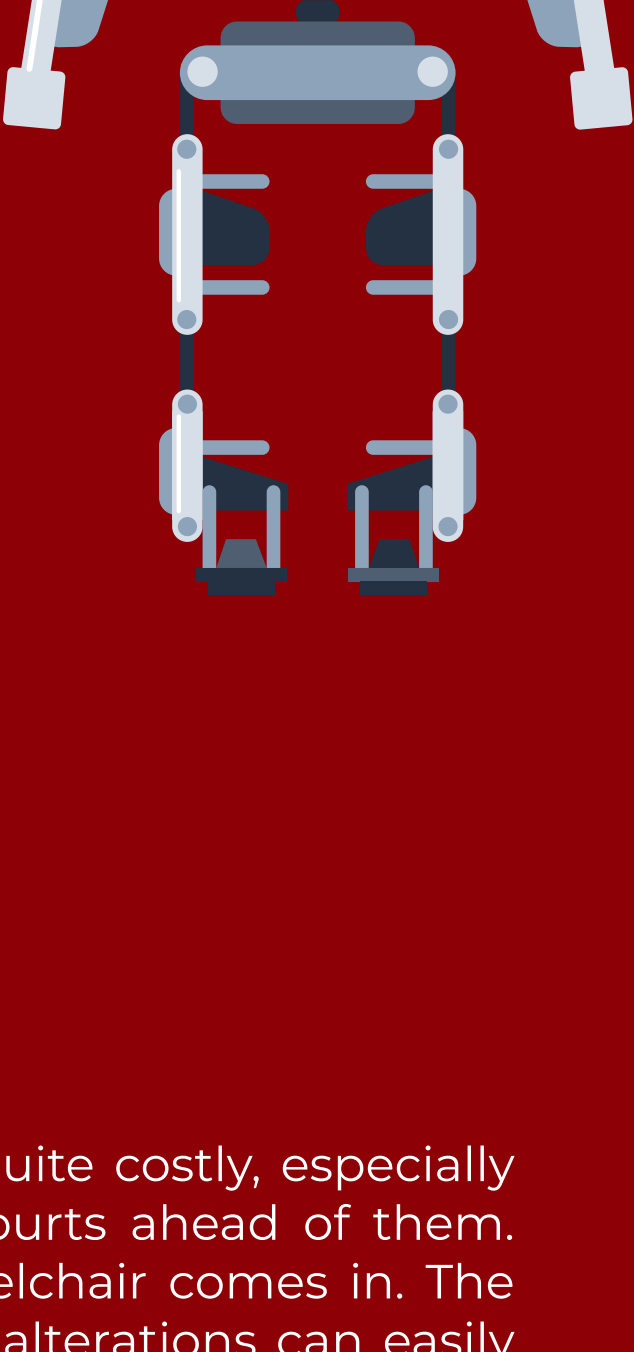
PROSTHETICS

UNICEF in cooperation with FIANZ has opened a prosthetic production site in Jordan to provide urgently needed medical aid to amputee children in Gaza. UNIDO has opened similar facilities in Lviv, Ukraine.



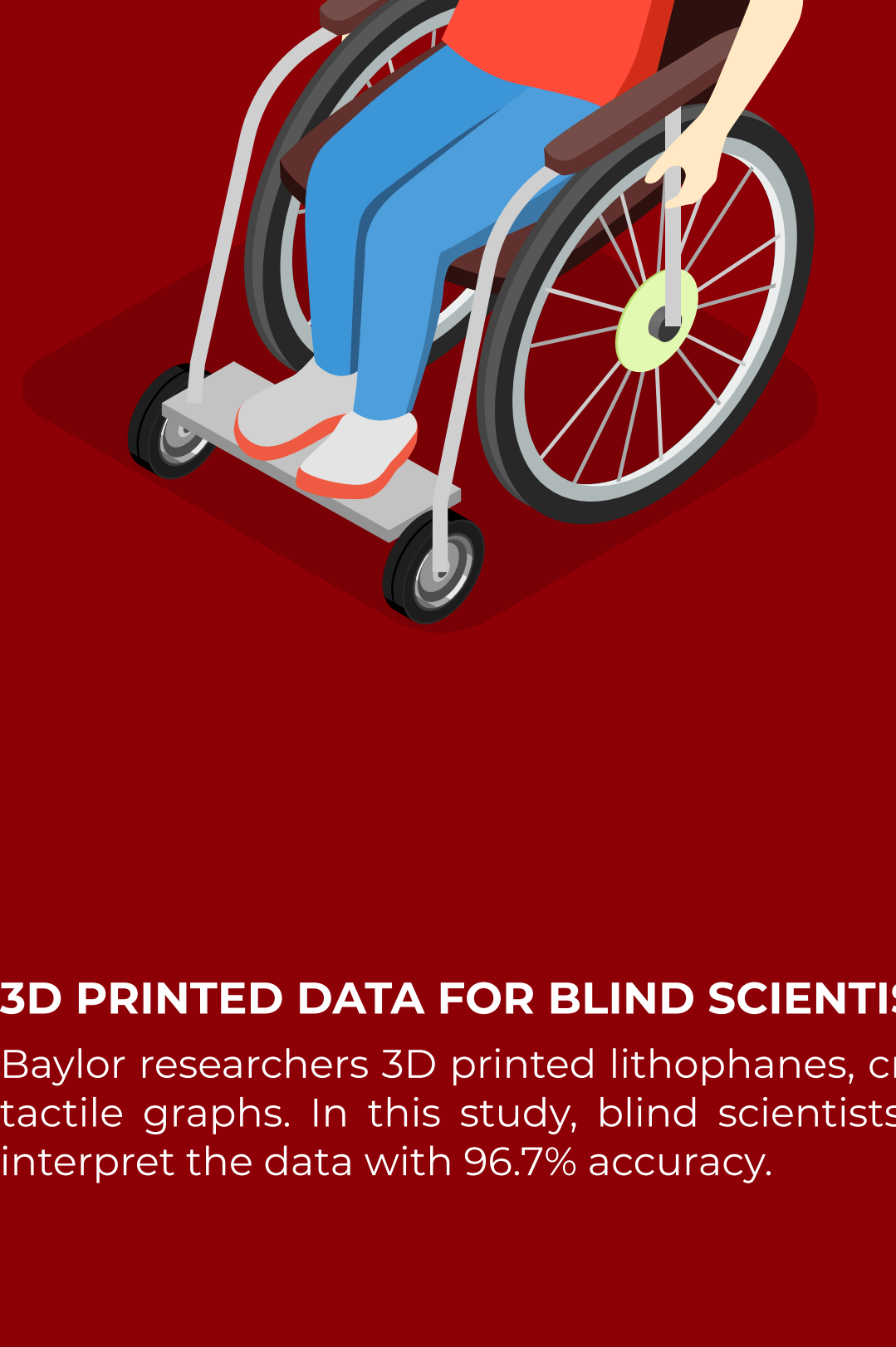
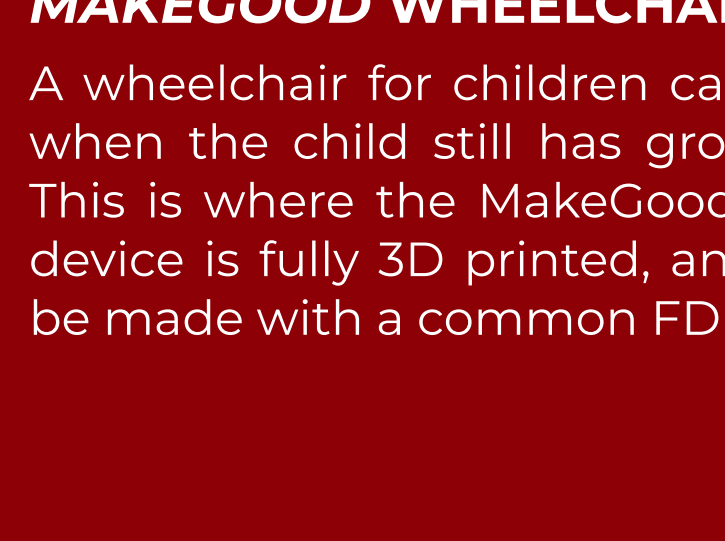
MAKEGOOD WHEELCHAIR

A wheelchair for children can be quite costly, especially when the child still has growth spurts ahead of them. This is where the MakeGood Wheelchair comes in. The device is fully 3D printed, and size alterations can easily be made with a common FDM printer.



FRAUNHOFER EXOSKELETON

This newly developed device helps people with mobility issues, especially tendon related issues, to perform intricate movements. Thanks to innovative scanning technology, the exoskeleton sits perfectly over a patient's hand.



3D PRINTED DATA FOR BLIND SCIENTISTS

Baylor researchers 3D printed lithophanes, creating tactile graphs. In this study, blind scientists could interpret the data with 96.7% accuracy.



KEY FIGURES

1/6th

According to UNICEF Aotearoa, a 3D printed prosthetic costs only 1/6th of the price of a conventionally manufactured prosthetic

(UNICEF)

€3,500

The price of a 3D printed prosthetic arm with vibro-tactile feedback, allowing wearers to feel when they touch something, created by Lorenzo Spreafico as a University of Leeds student

(SPREAFICO)

7,000+

The number of 3D printed hands and arms created and gifted to children and adults around the world through the e-NABLE community, an open-source platform dedicated to sharing designs for 3D printed prosthetics

(E-NABLE)

10 MILLION

Around 10 million 3D printed hearing devices are in circulation right now.

(REEVES)

0.3 MILLIMETERS

The accuracy of 3D scans, capturing tiny contours, done by the University of Virginia to create tactile reliefs and replicas for making museums more accessible to blind and low-vision people

(NEWMAN)

372

The approximate number of 3D-printable items available on the platform Rehab-Lab, an online space like Thingiverse or Cults, where the community can upload their own designs for disability aids.

(REHAB-LAB)

TIMELINE

- 1990** ● A research group from Northwestern University and Baxter Healthcare 3D printed a single trans-tibial (TT) socket using stereolithography.
- 1992** ● A 3D printed socket fabricated with selective laser sintering, by the University of Texas, Austin, was wear-tested for the first time.
- 2012** ● Artist Ivan Owen, in collaboration with e-NABLE, 3D printed the first prosthetic hand.
- 2016** ● German Paralympic cyclist Denise Schindler competed in the 2016 Rio Paralympics with a 3D printed prosthetic leg, becoming the first to use a 3D printed limb at the games.
- 2017** ● KnE Engineering publishes the first study on 3D printed visually appetizing foods for people with dysphagia using pureed tuna, pumpkin and beetroot.
- 2019** ● IKEA launches the ThisAbles initiative, a series of 3D printed objects to be fixed on pieces of furniture to help people with disabilities.
- 2021** ● The first successful 3D printed eye transplant took place.
- 2024** ● Monash University releases the first guide on 3D printing for blind and low-vision people.
- 2025** ● MakeGood, in collaboration with Tikkun Olam Makers, create the first fully 3D printed wheelchair for children.