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3D Technologies for Disability

A few examples of how low-cost 3D printers (FDM technology) have been used to create solutions to mitigate physical disabilities

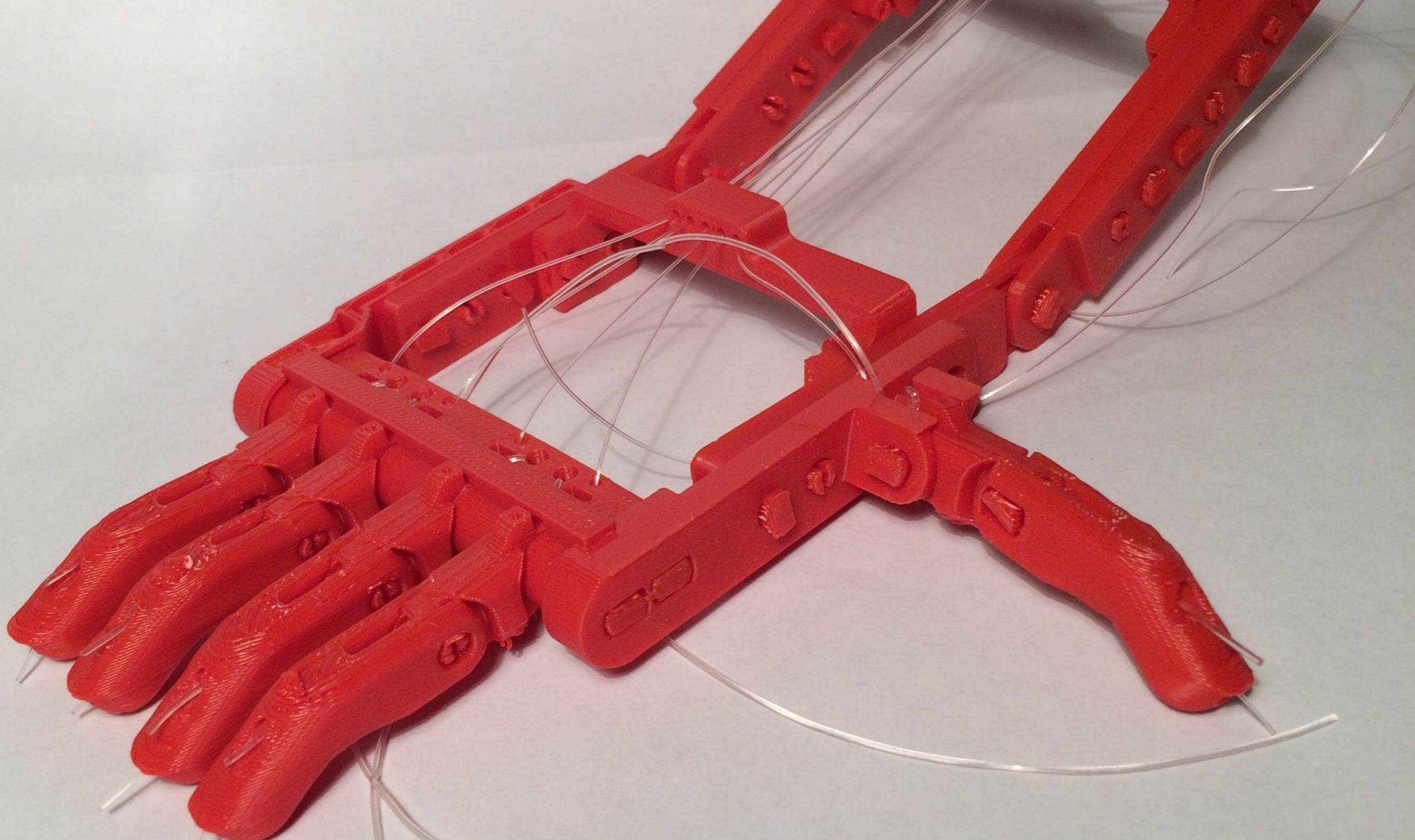


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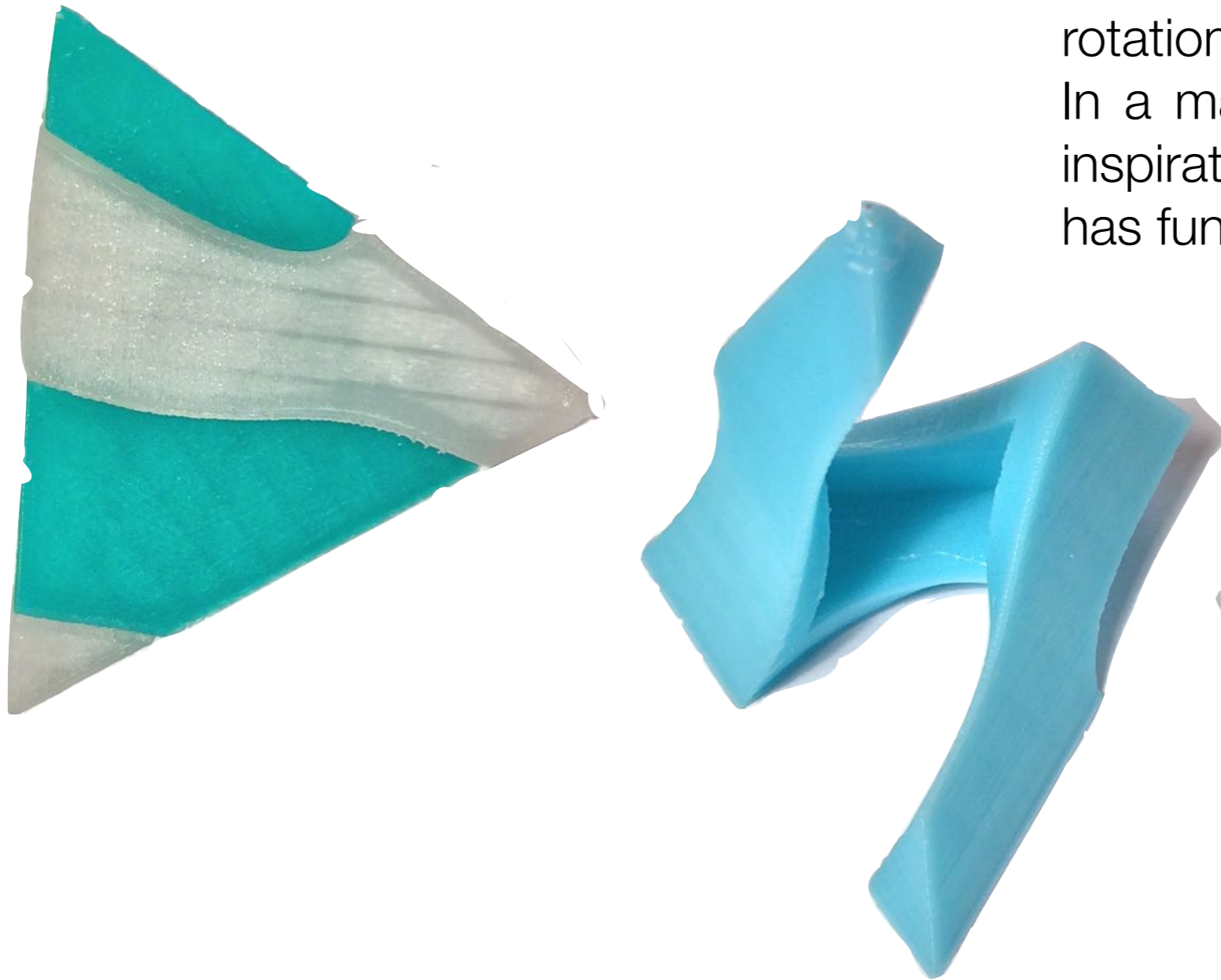


The few examples presented here are just a small subset of what is possible, we use them to stimulate a discussion

... please contribute your ideas!

These puzzles challenge anyone who plays with them to think about combining the geometric transformations of translation and rotation in new ways.

In a math class, they also provide inspiration to see that mathematics has fun and creative applications.



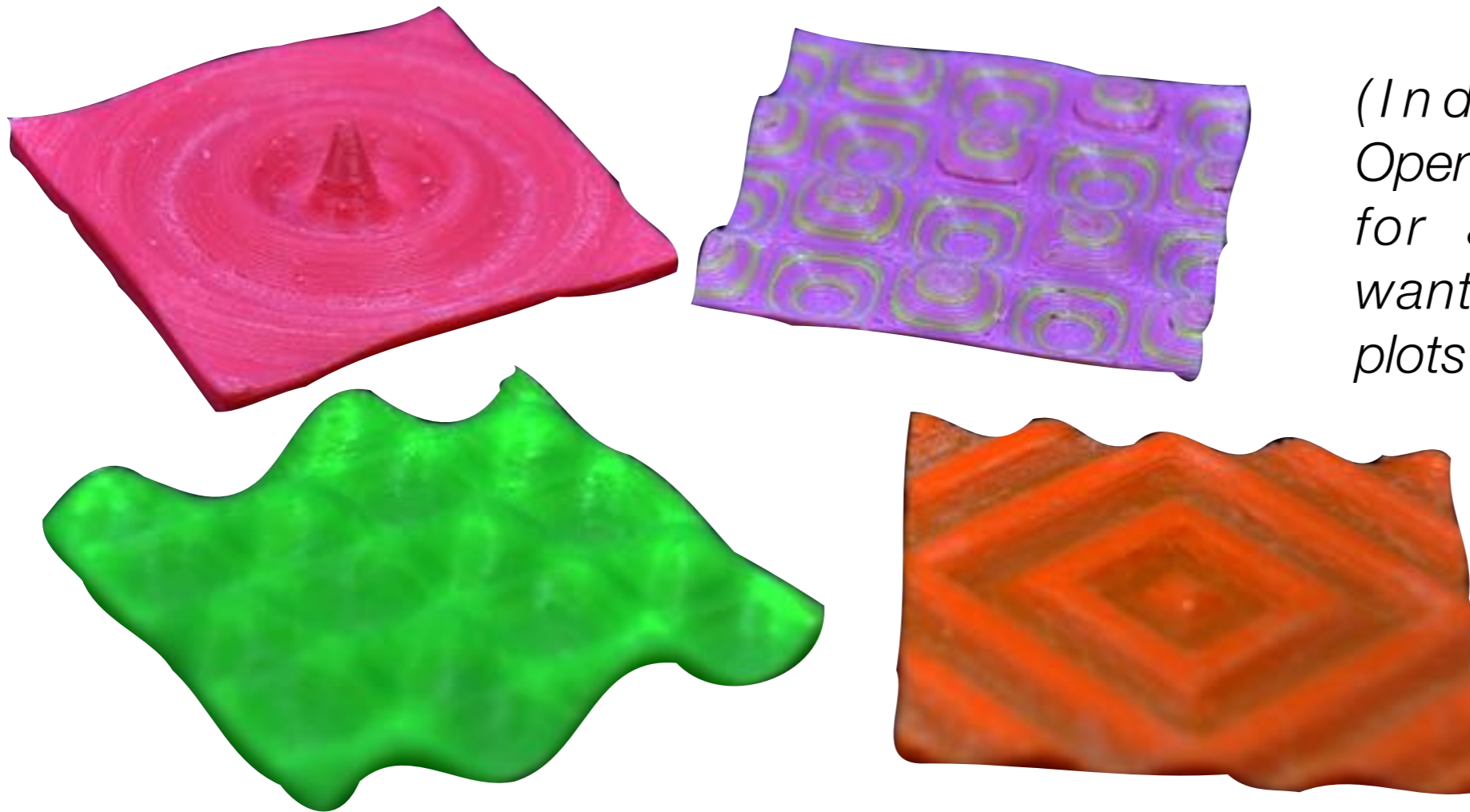
Screw-puzzle
by George Hart

<http://www.thingiverse.com/thing:186372>

“Could there be anything more fun than drawing 3D surface plots?”

Yes, you can 3D print 3D surface plots and hold them in your own hands!

(Indeed, I wrote this OpenSCAD program in 2011 for a math teacher who wanted some tangible 3D plots for a blind student.)”



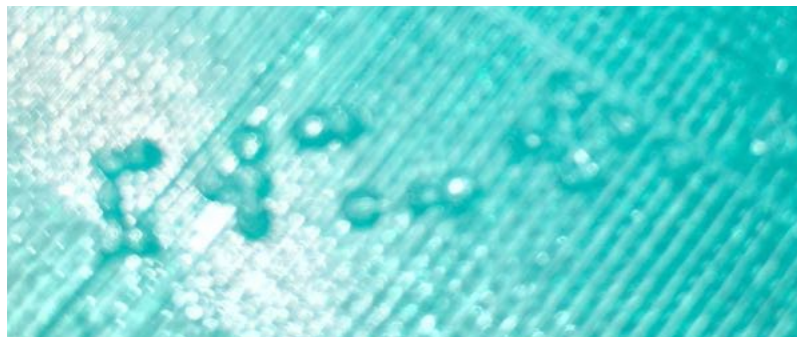
OpenSCAD 3D Surface
Plotter

<http://www.thingiverse.com/thing:24897>

The planets of our solar system mounted on 3mm thick boards.

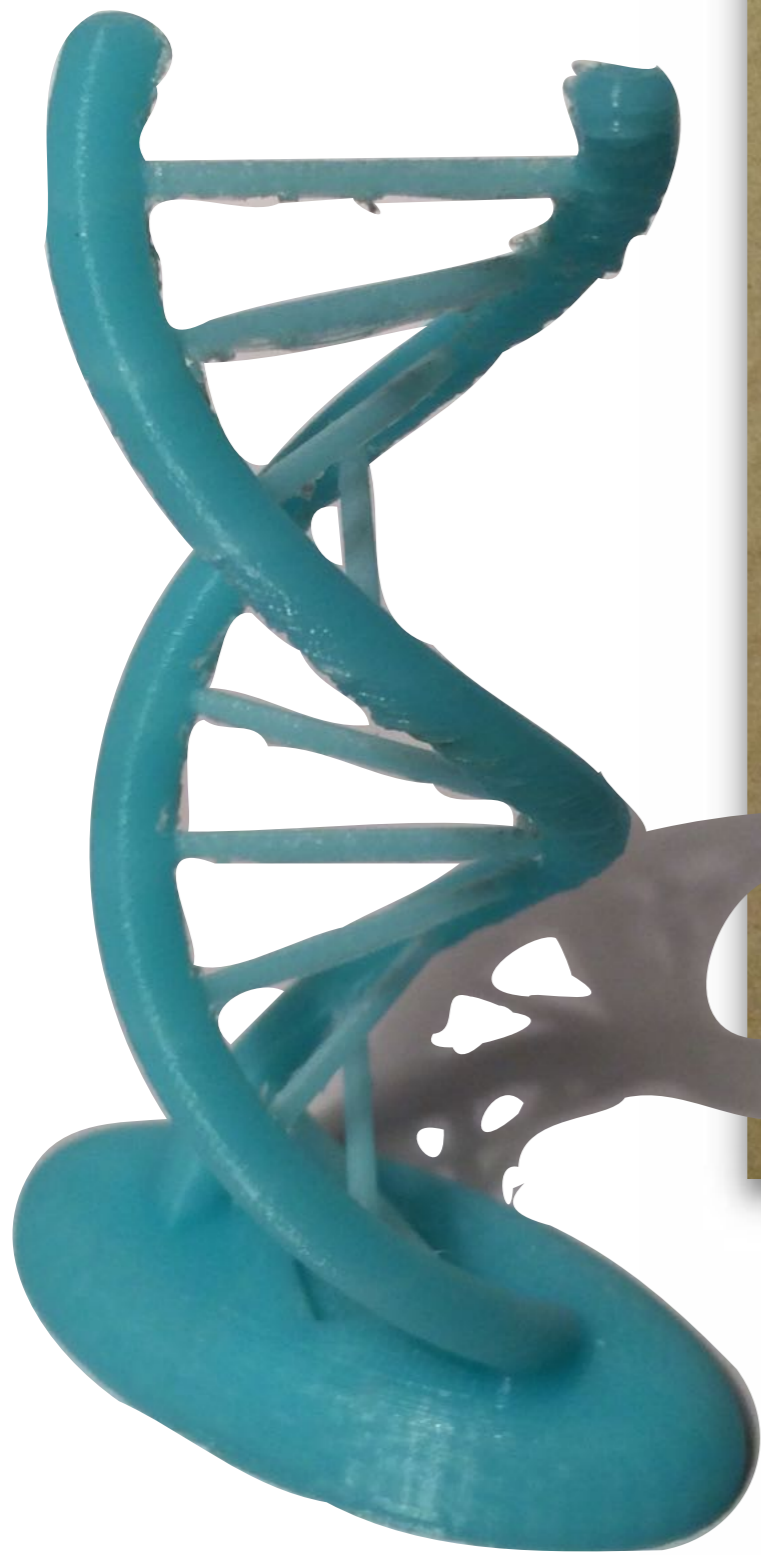
All the planets are represented in correct size. The size reference is the sun (1 meter in diameter, could be represented by for example a beach ball)

The planet name is printed in Braille above the planet and the order from the sun is printed below the planet.



Our solar system for the blind

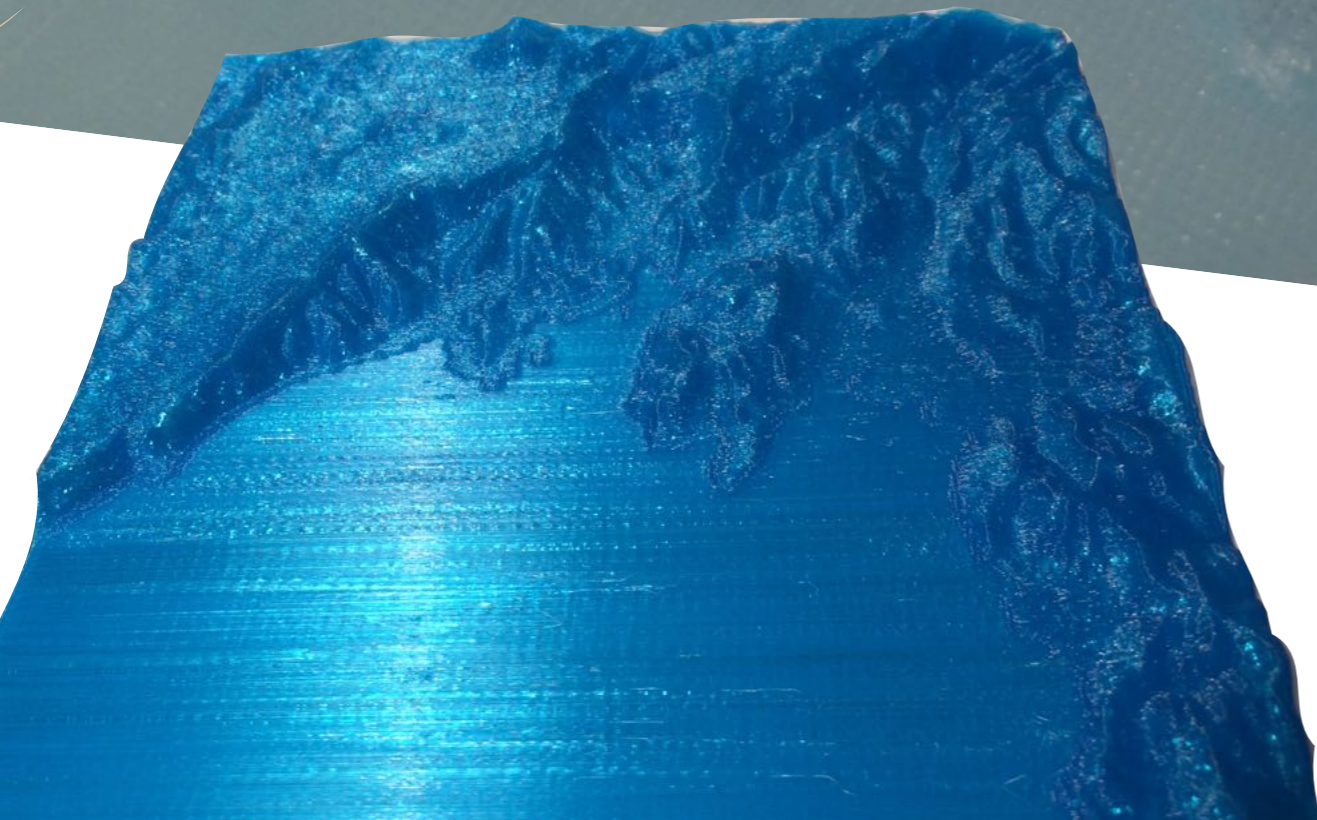
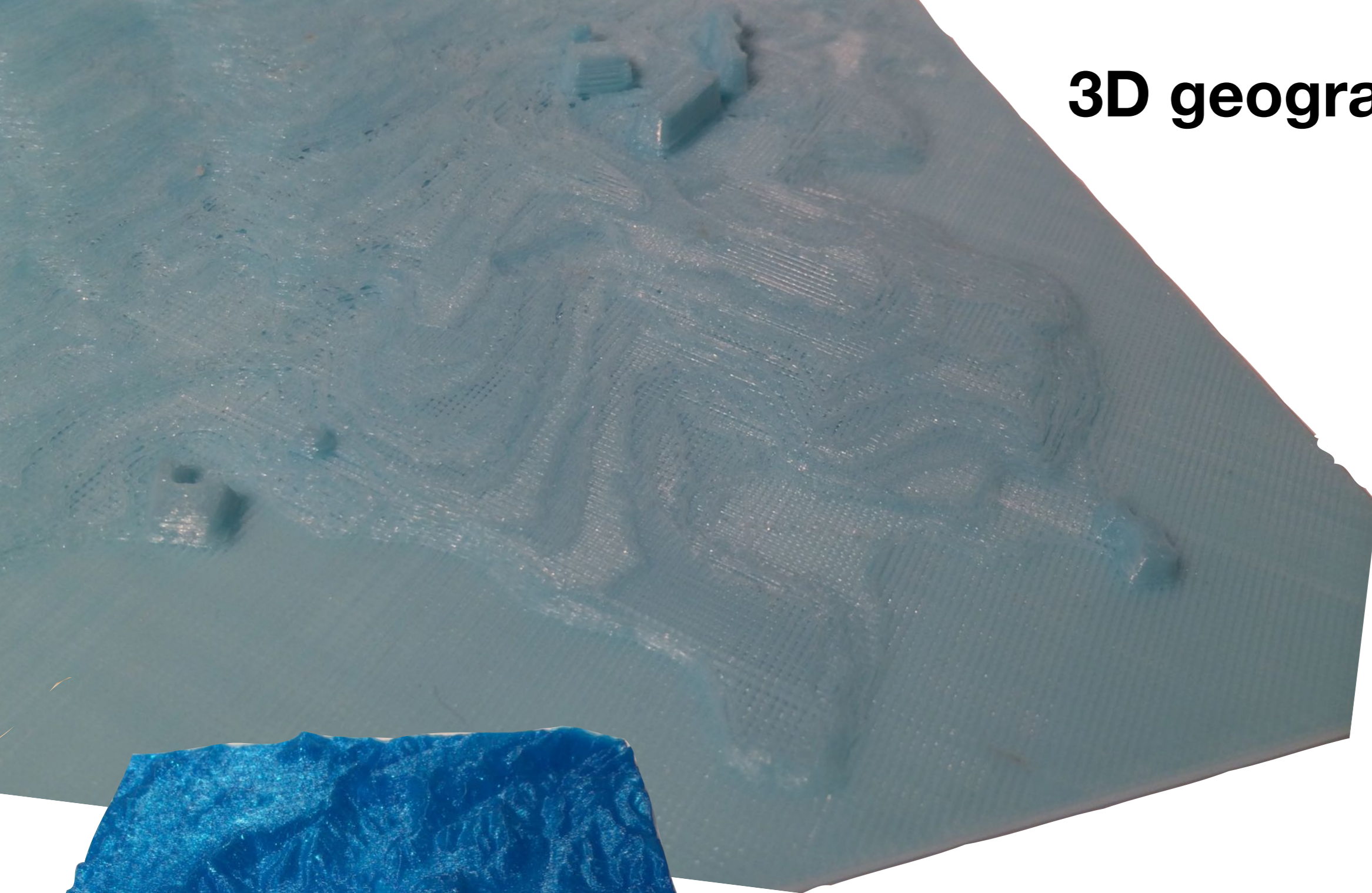
<http://www.thingiverse.com/thing:65916>



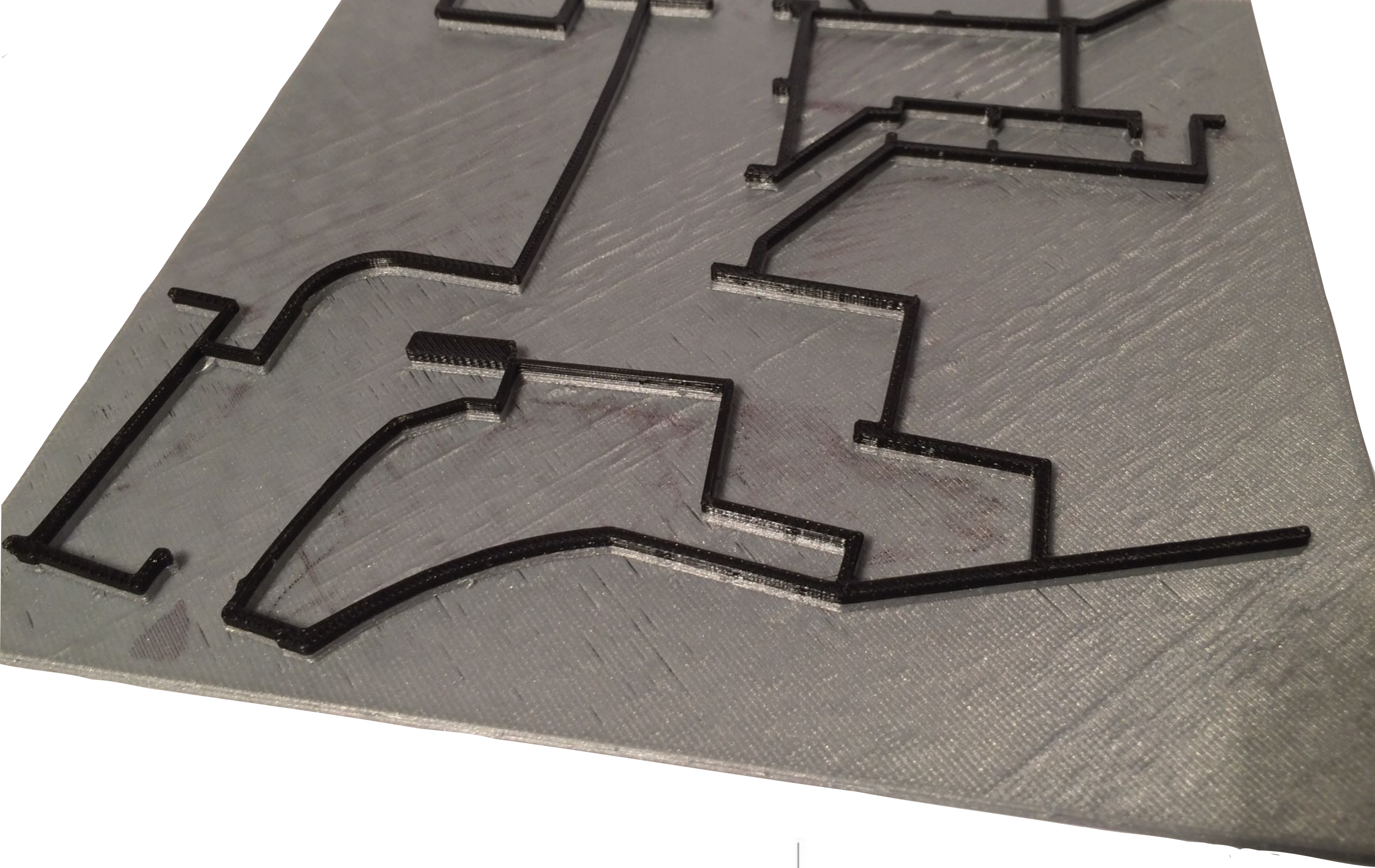
Double Helix of DNA

<http://www.thingiverse.com/thing:10398>
<http://www.thingiverse.com/thing:17343>

3D geographical maps



ICTP Miramare Campus
Gulf of Triest
(by Gaya Fior, www.32b.it)



Tactile map of a building

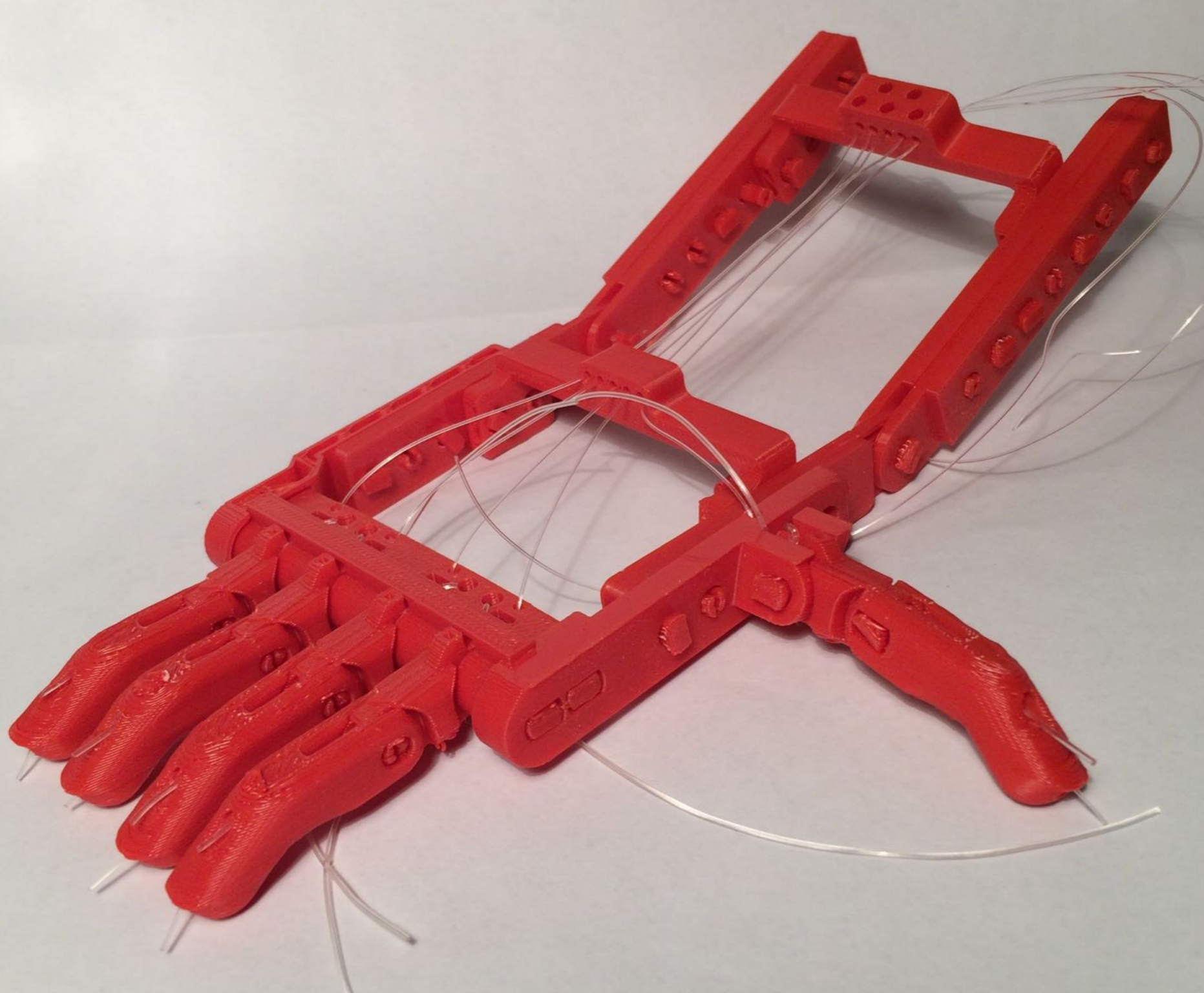
Immaginario Scientifico
(by C. Fonda, F. Deganis)

Right angle, 90 degree, assistive device (spoon) for someone with, for example, limited grip strength or control. Quick design and prototype of assistive device. This demonstrates that anyone with beginner skills and freeware 3D design software can prototype assistive devices in real time. This project took 20 minutes from design (trueSpace) to printing (Up!3D) in ABS.



Right angle spoon

<http://www.thingiverse.com/thing:23729>



Not everyone is fortunate enough to have two hands.

Robohand is an open source tool created to help restore the superpowers of humans who are missing the fingers from their hand. The original version was created by Richard Van As and Ivan Owen.

Robohand

Complete set of mechanical anatomically driven fingers

<http://www.thingiverse.com/thing:44150>

<http://www.thingiverse.com/thing:92937>



Movie from: <http://www.thingiverse.com/thing:44150>