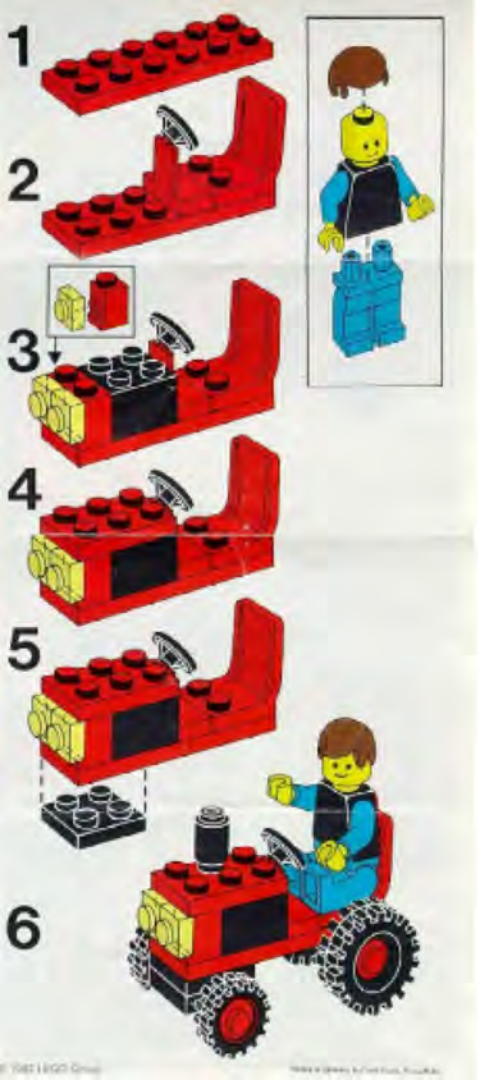
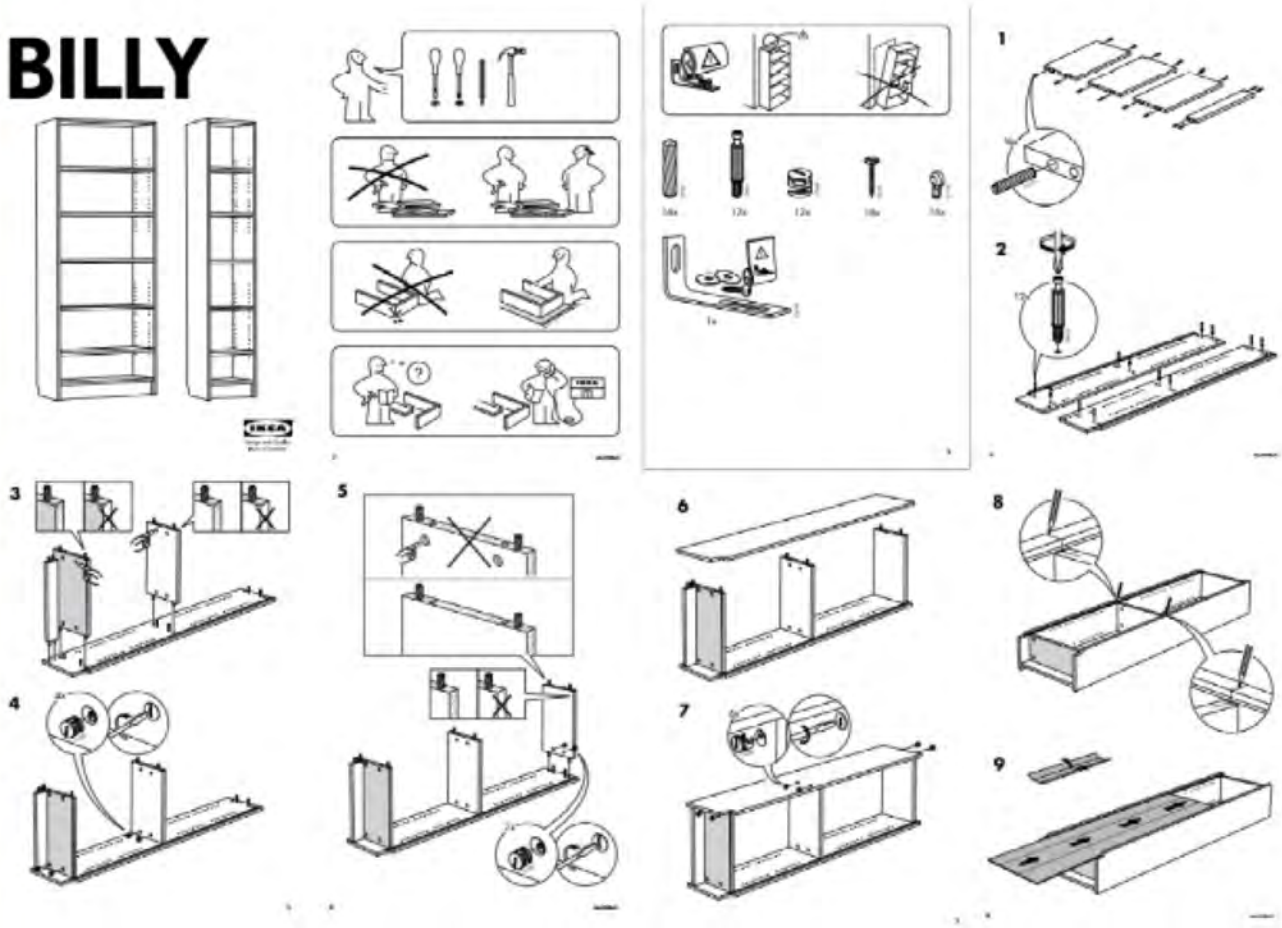
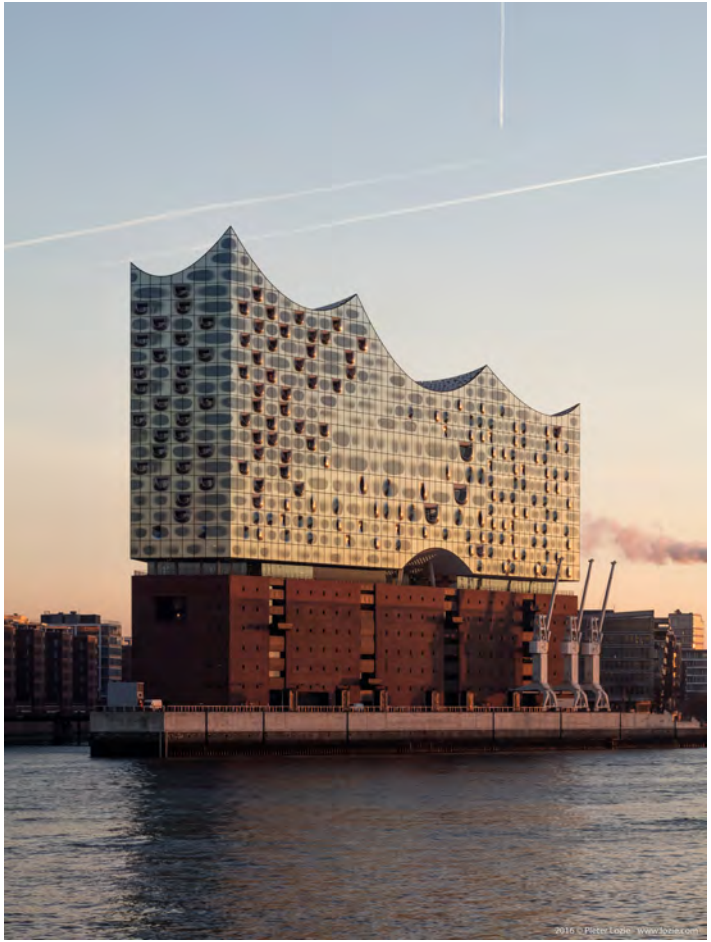
Algorithmic design as a designer’s tool

Sami Markkula -11.3.2019





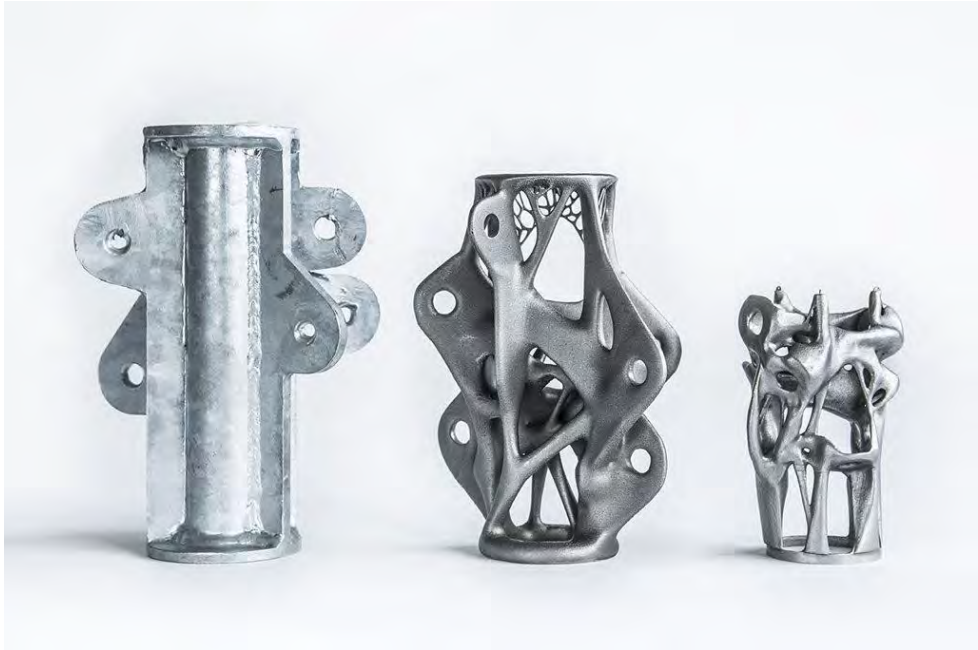
https://extemporeapp.com/assembly-instructions-assisting-the-non-visual-ikea-customers/
http://lego.brickinstructions.com/lego_instructions/set/6608/Tractor



Elbphilharmonie Concert Hall
Hamburg, Germany – 2017

Left: http://www.lozie.com/home/elbphilharmonie-hamburg-germany-5/
Rgiht: https://archinect.com/news/article/149978596/take-a-stroll-inside-herzog-de-meuron-s-elbphilharmonie-hamburg-courtesy-of-google

Autodesk - DreamCatcher Research



3D-printing steel nodes

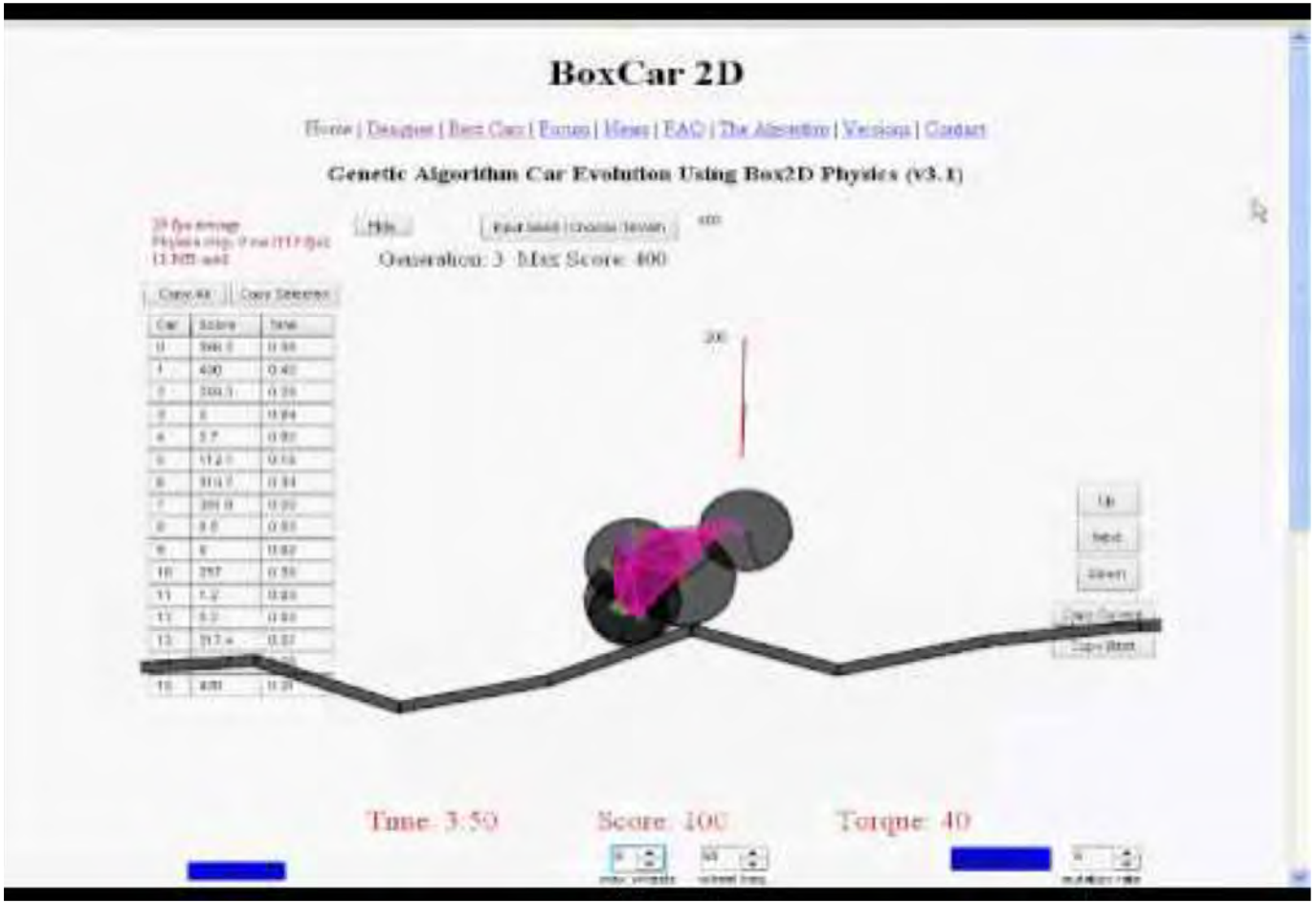
Bike Stem

Left: https://medium.com/intuitionmachine/the-alien-look-of-deep-learning-generative-design-5c5f871f7d10
Right: https://www.instructables.com/id/How-to-Design-a-Bike-Stem-in-Dreamcatcher/

Autodesk - DreamCatcher Researcl

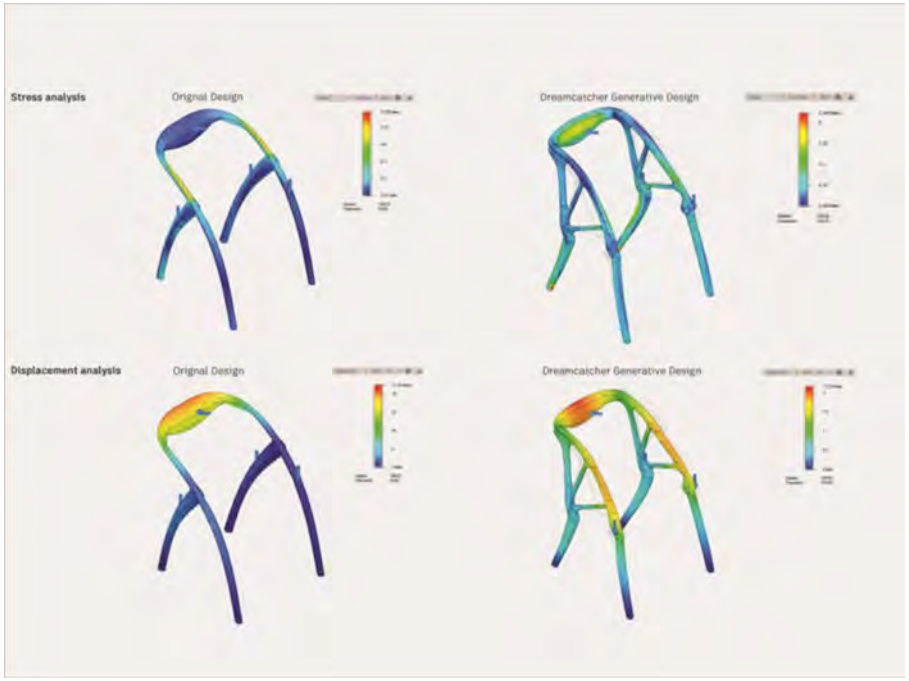
Lightweight Load-bearing engine bl

https://www.autodesk.com/redshift/generative-design/



VIDEO LINK: https://www.youtube.com/watch?v=L5YqLps28NA&t=6s

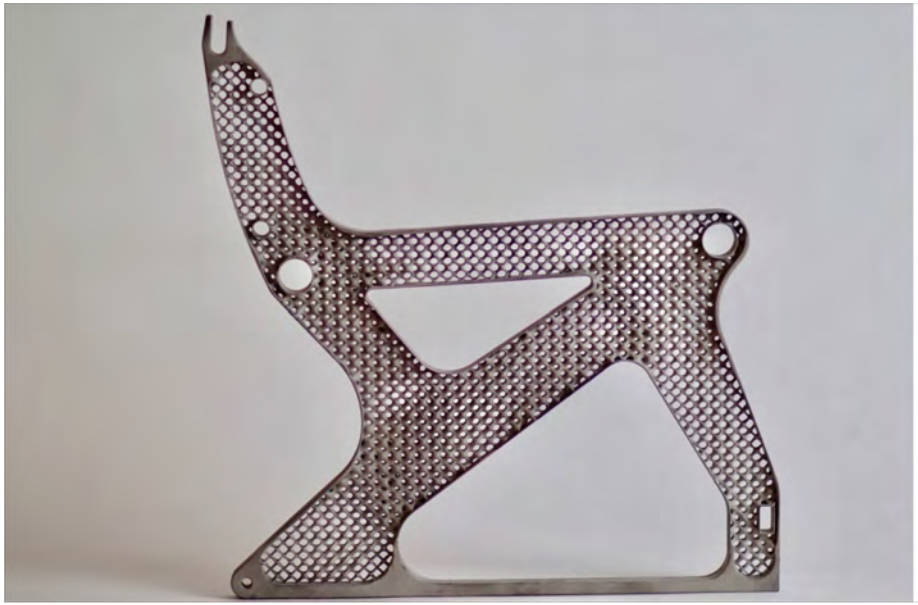
Compared to the original design, Dreamcatcher's solution has 18% less volume and decreases the max displacement by 90.4% as well as decreases the max von Mises stress by 78.6%. That is less material, less bending (displacement) of the wood when you sit in the chair, and an equal distribution of your weight across the frame.

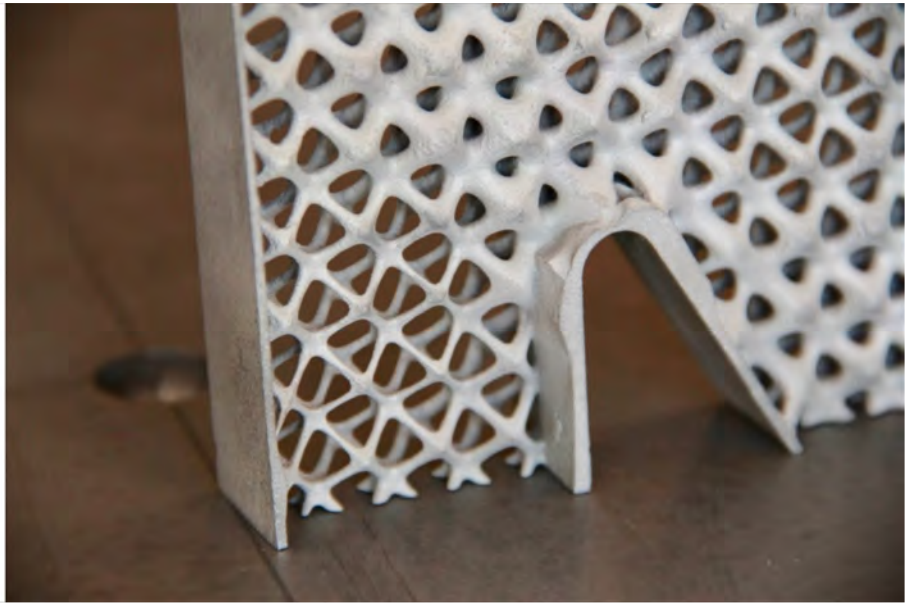


http://labs.blogs.com/its_alive_in_the_lab/2016/09/fusion-360-and-project-dreamcatcher-chair.html

Autodesk - DreamCatcher Research

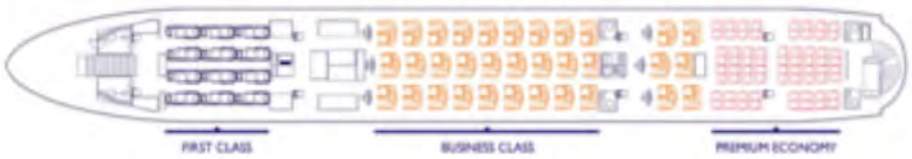
Lightweight Load-bearing engine block





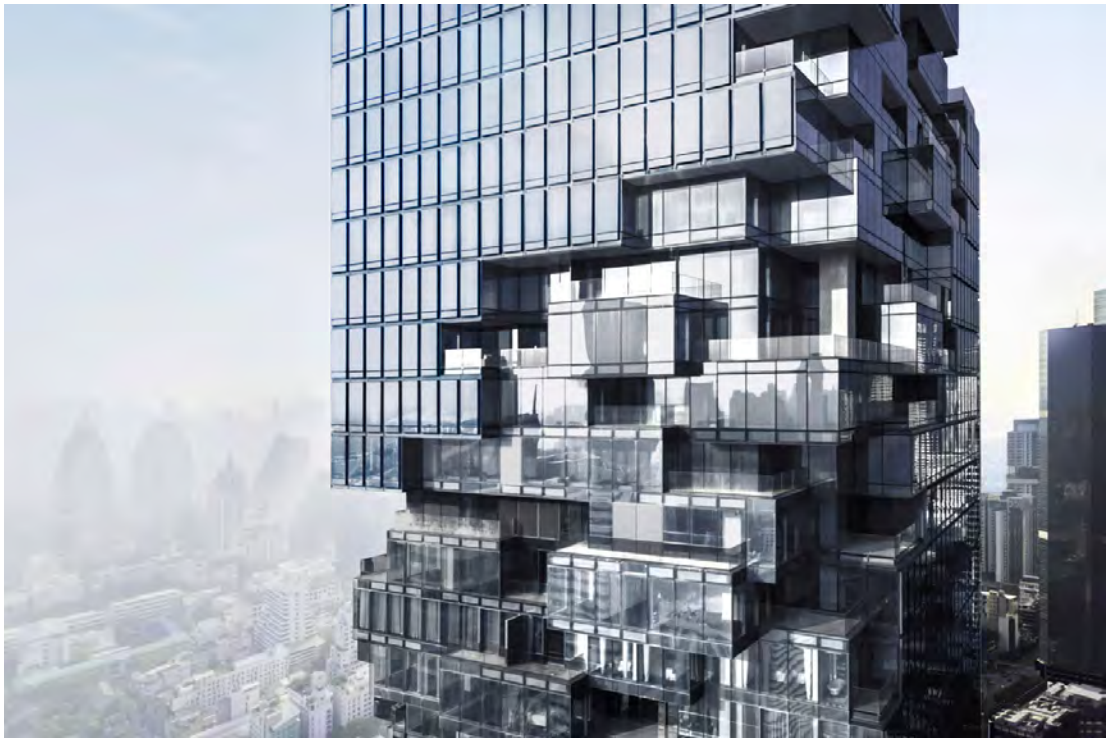
http://blogs.autodesk.com/inthefold/light-weight-airplane-seat-can-save-airlines-200000000-dramatically-reduce-carbon-emissions/

	A321 236 seats	A380 615 seats
Weight Savings	214kg	557kg
Annual Fuel Savings Per Aircraft	9.6 tonnes	63 tonnes
Annual Carbon Emission Reduction Per Aircraft	28.9 tonnes	190.1 tonnes
Annual Fleet Savings (assuming fleet of 100 aircraft)	$1,569,365	$10,332,446
Lifetime Fleet savings (100 aircraft over 20 years)	**$31,387,300**	**$206,648,920**
Fleet Lifetime Reduction in Carbon (100 aircraft over 20 years)	**57,800 tonnes / 12,298 cars**	**126,000 tonnes / 80,894 cars**



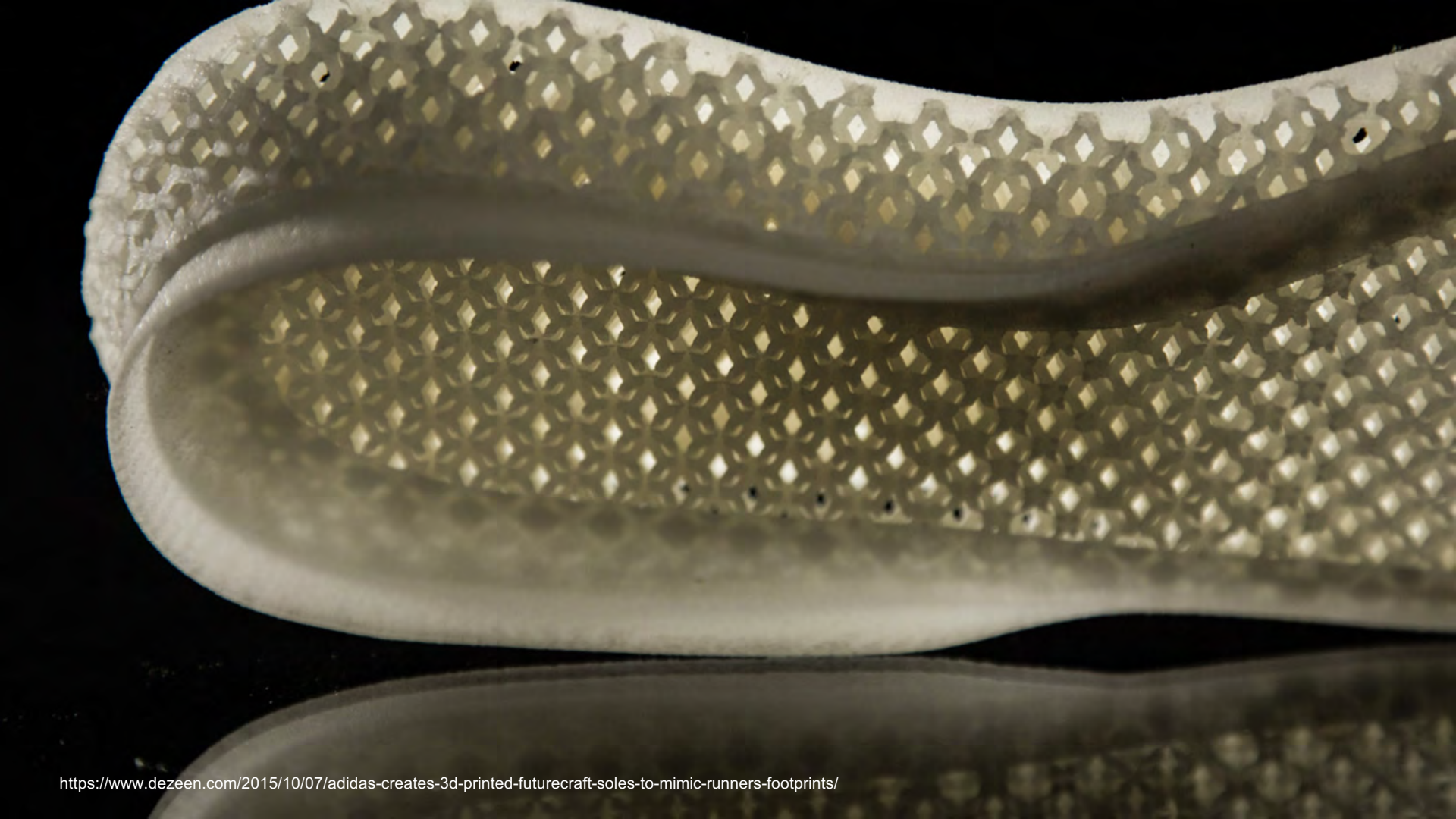
http://blogs.autodesk.com/inthefold/light-weight-airplane-seat-can-save-airlines-200000000-dramatically-reduce-carbon-emissions/

King Power MahaNakhon
Bangkok, Thailand – 2016.



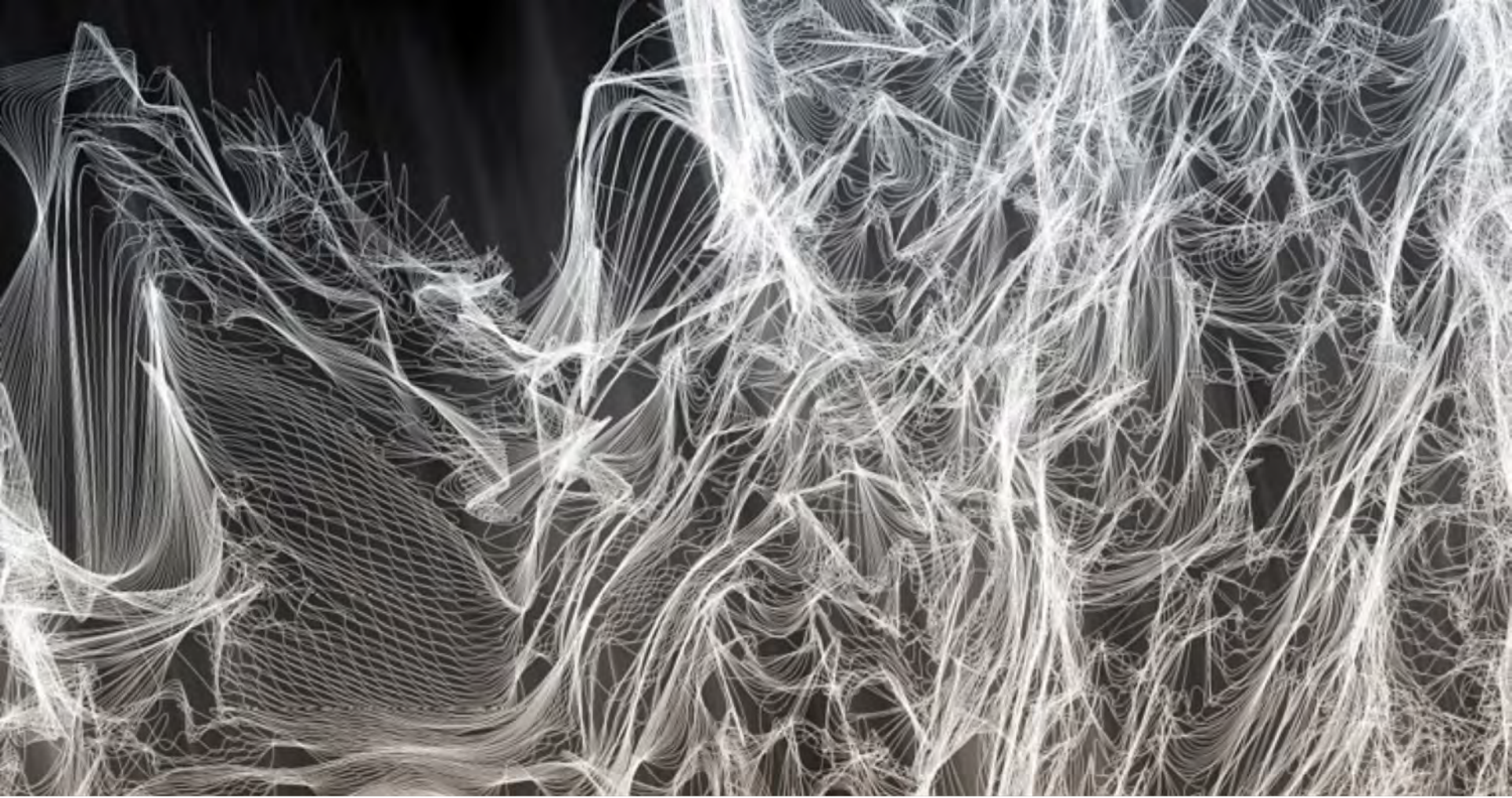
Right : https://en.wikipedia.org/wiki/King_Power_MahaNakhon#/media/File:MahaNakhon_by_kylehase.jpg
Left: https://archpaper.com/2018/11/bu%CC%88ro-ole-scheeren-completes-thailands-tallest-tower/mahanakhon-by-buro-ole-scheeren-buro-os_10-photo-by-wison-tungthunya/

https://www.dezeen.com/2015/10/07/adidas-creates-3d-printed-futurecraft-soles-to-mimic-runners-footprints/



https://www.dezeen.com/2015/10/07/adidas-creates-3d-printed-futurecraft-soles-to-mimic-runners-footprints/

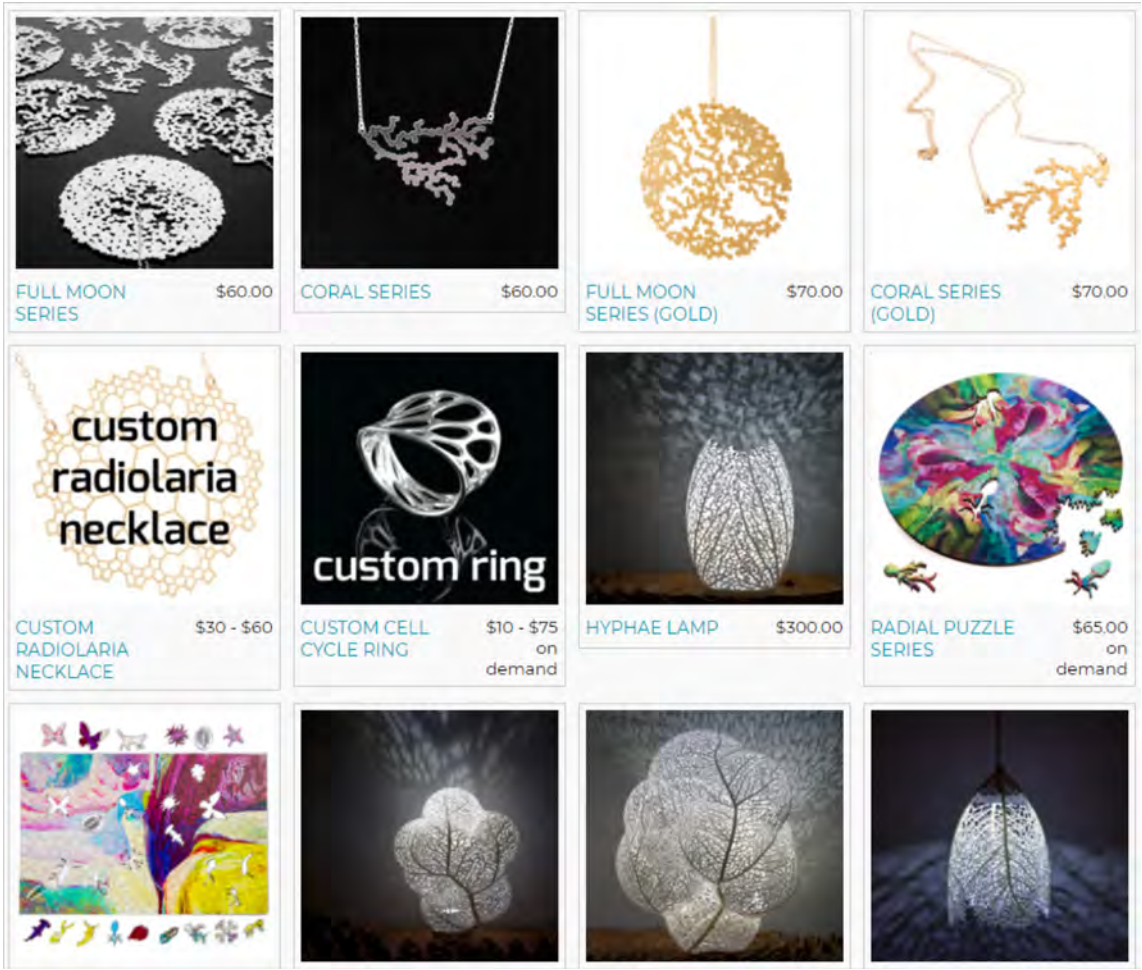
http://code.algorithmicdesign.net/Turtle-Nesting



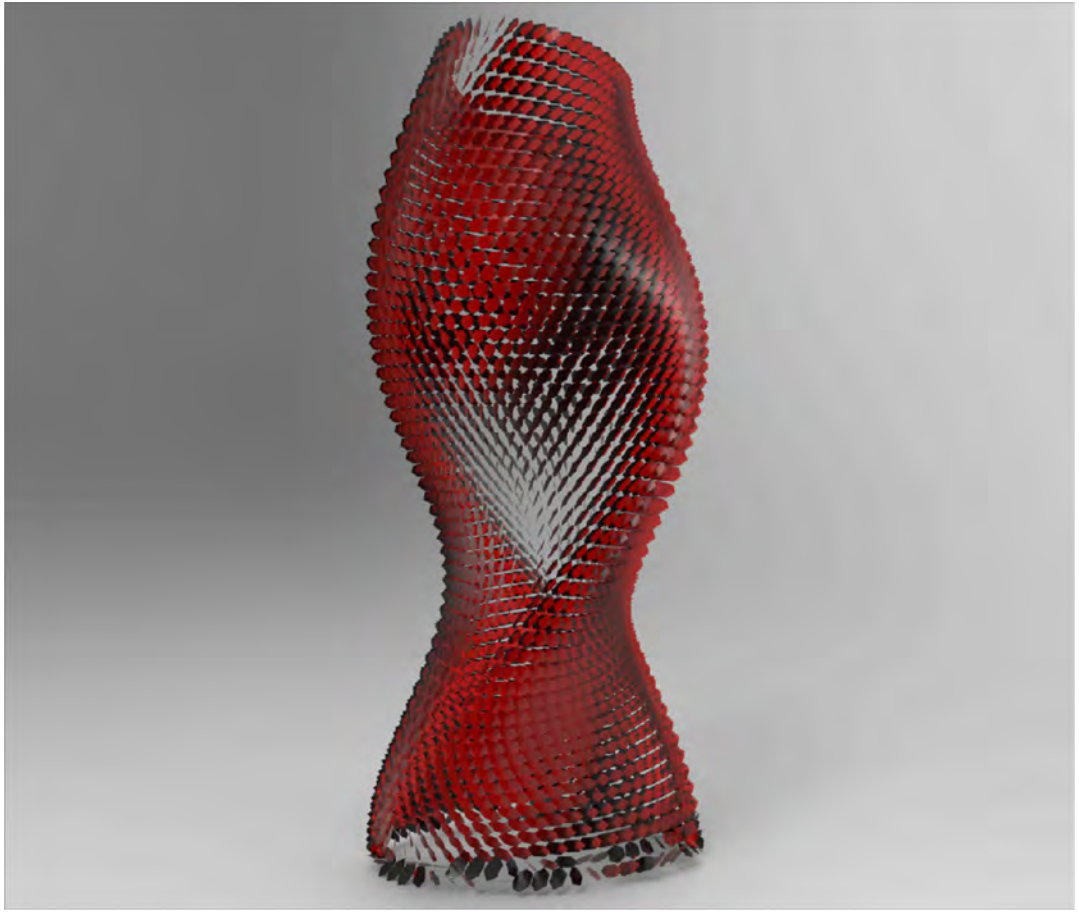
http://algorithmicdesign.net/

Nervous System

A generative design studio

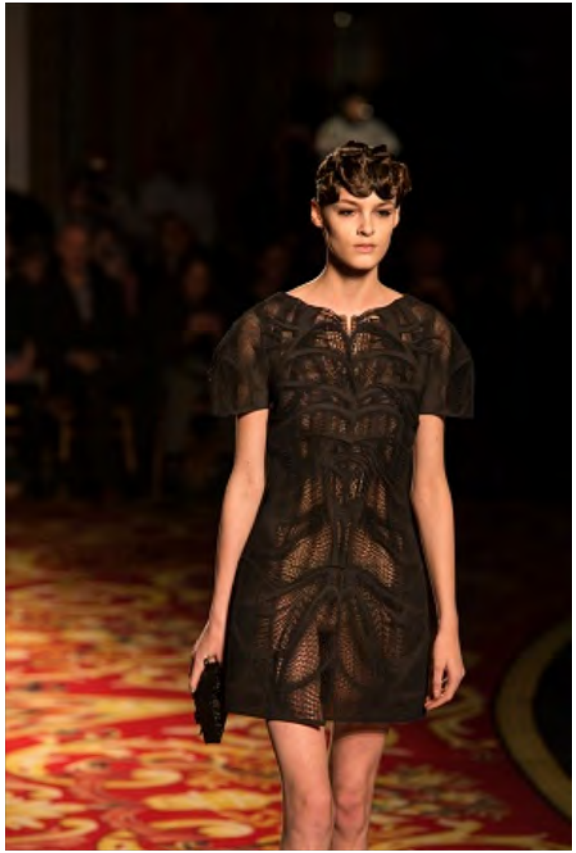


https://n-e-r-v-o-u-s.com/index.php



https://www.reddit.com/r/gifs/comments/9oeze0/animated_tower_designed_on_rhino_grasshopper

Iris van Herpen - 2013



Ganit Goldstein - 2017

Danit Peleg

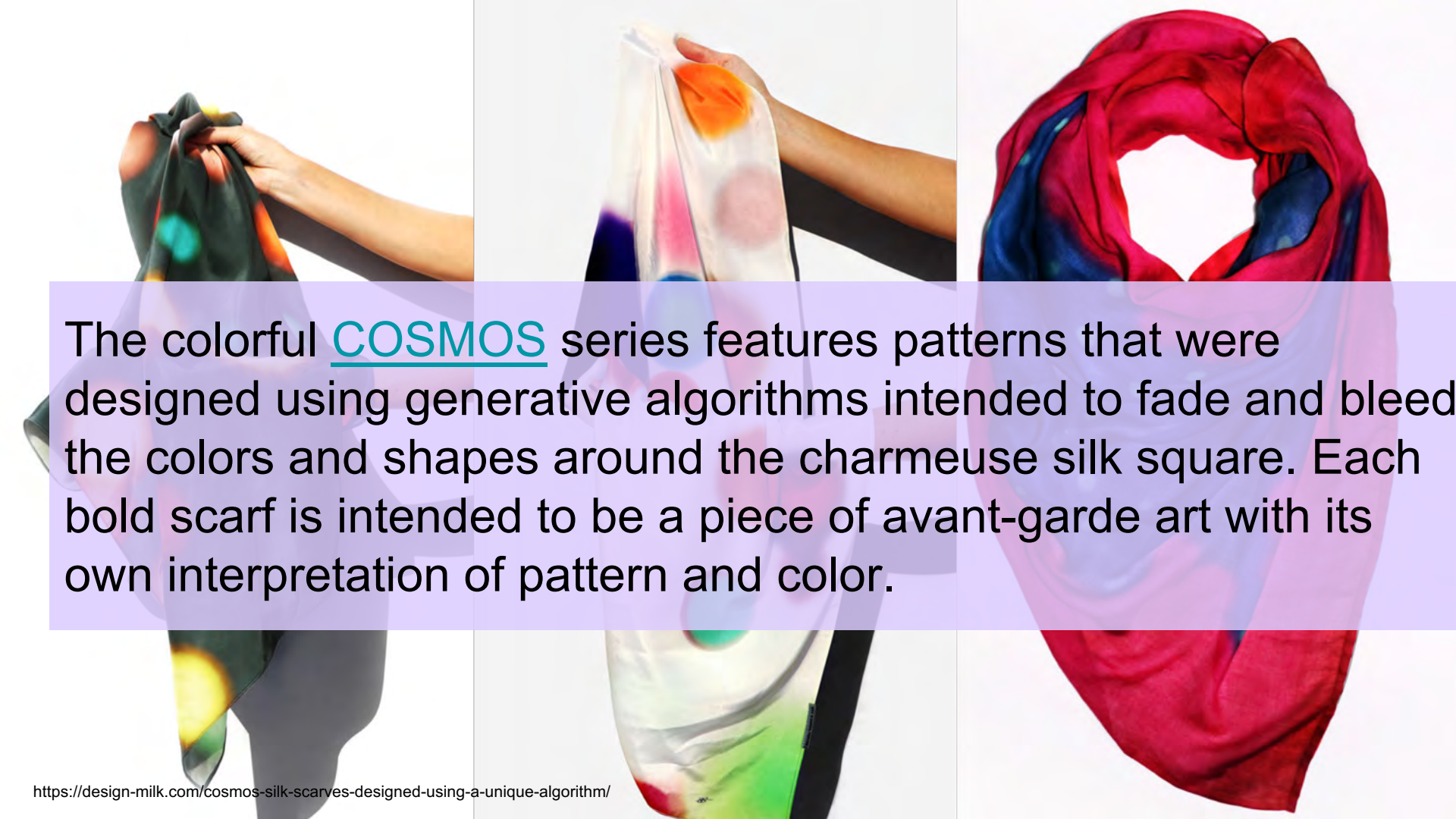
https://www.materialise.com/en/cases/iris-van-herpen-debuts-wearable-3d-printed-pieces-at-paris-fashion-week
https://www.timesofisrael.com/this-textile-artist-looks-to-the-past-to-print-3d-fabrics-of-the-future/
https://danitpeleg.com/product/create-your-own-3d-printed-jacket/

Ilabo by Ross Lovegrove
In collaboration with Arturo Tedeschi

Ammonite by Fernando Romero

https://www.dezeen.com/2015/04/13/united-nude-3d-printed-shoes-zaha-hadid-ben-van-berkel-michael-young-milan-2015/

https://design-milk.com/cosmos-silk-scarves-designed-using-a-unique-algorithm/



The colorful COSMOS series features patterns that were designed using generative algorithms intended to fade and bleed the colors and shapes around the charmeuse silk square. Each bold scarf is intended to be a piece of avant-garde art with its own interpretation of pattern and color.

https://design-milk.com/cosmos-silk-scarves-designed-using-a-unique-algorithm/

VIDEO LINK: https://www.youtube.com/watch?v=nLtmEjqzg7M

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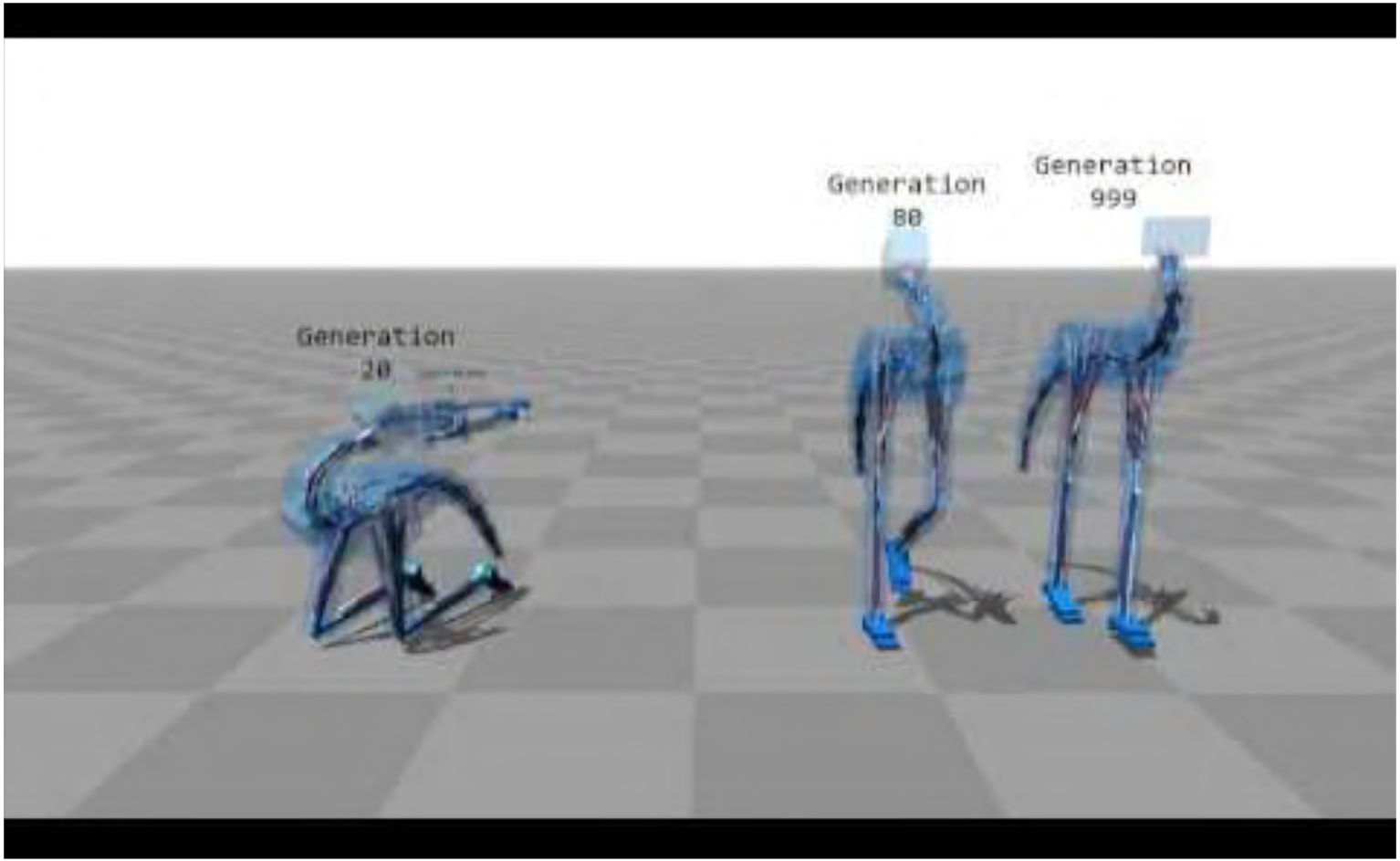

VIDEO LINK: https://www.youtube.com/watch?v=pgaEE27nsQw