

What Is GENERATIVE DESIGN?

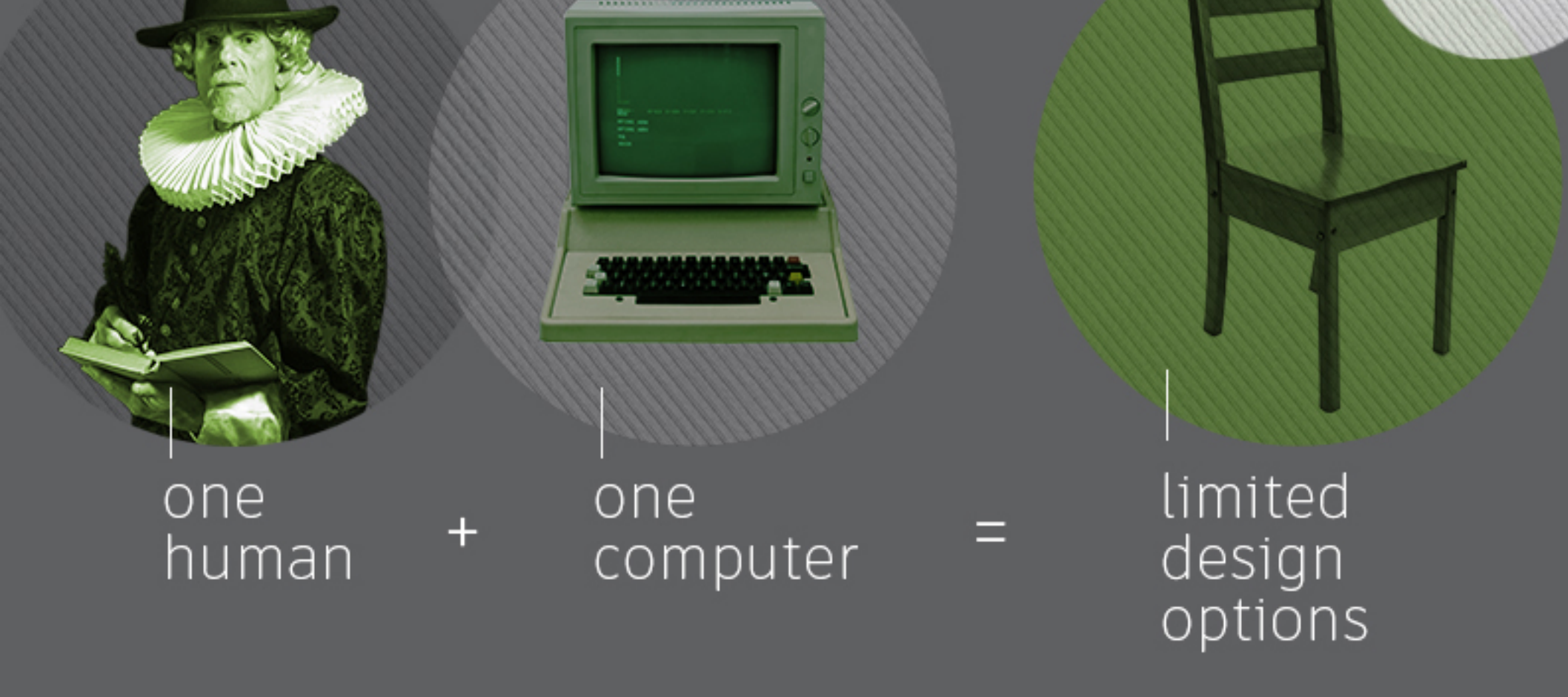


Learn how people and computers can cocreate things that humans alone could never imagine.



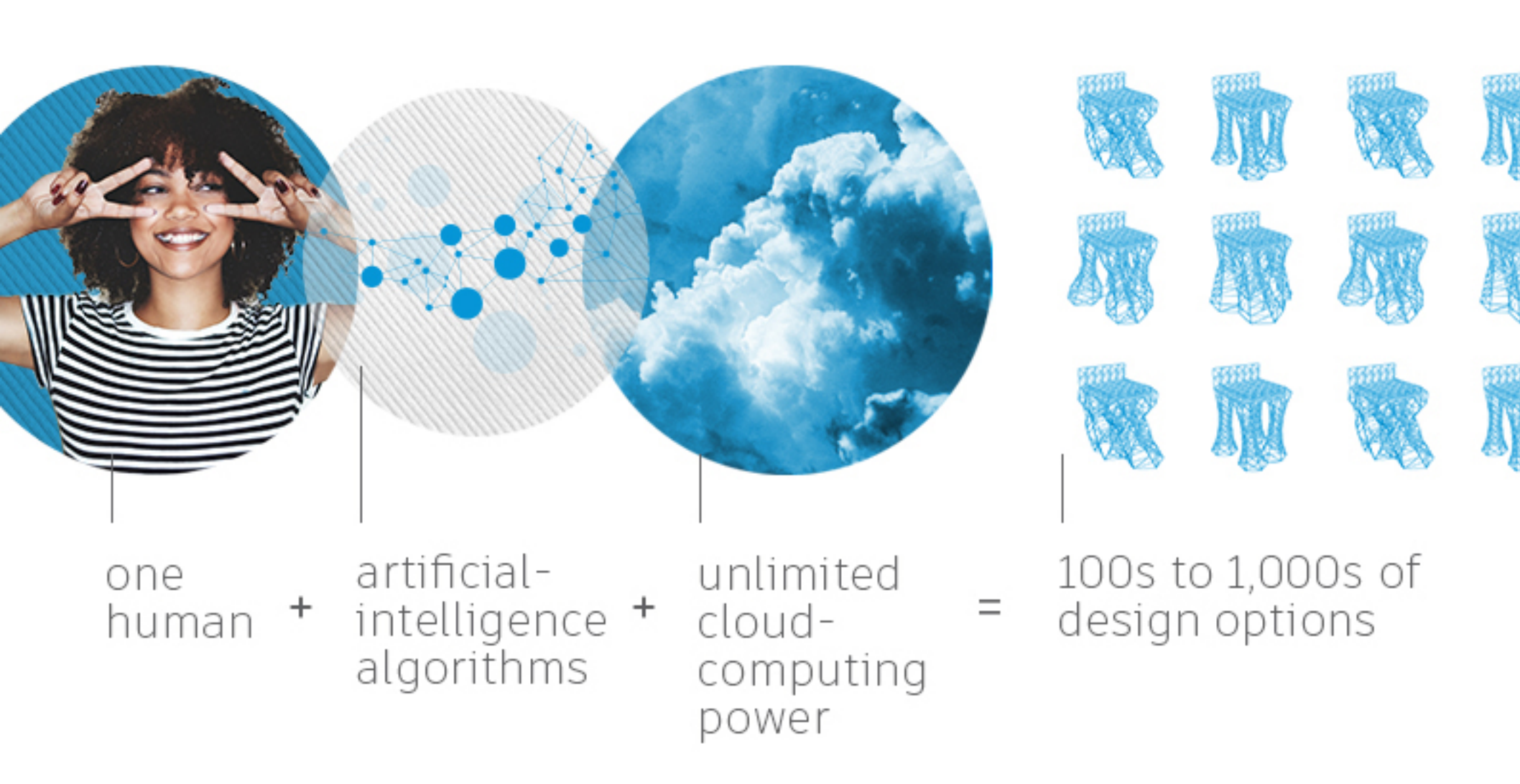
THE OLD WAY

Designer/engineer uses computer as passive machine.



THE NEW WAY

Computer and designer/engineer unite as cocreators.



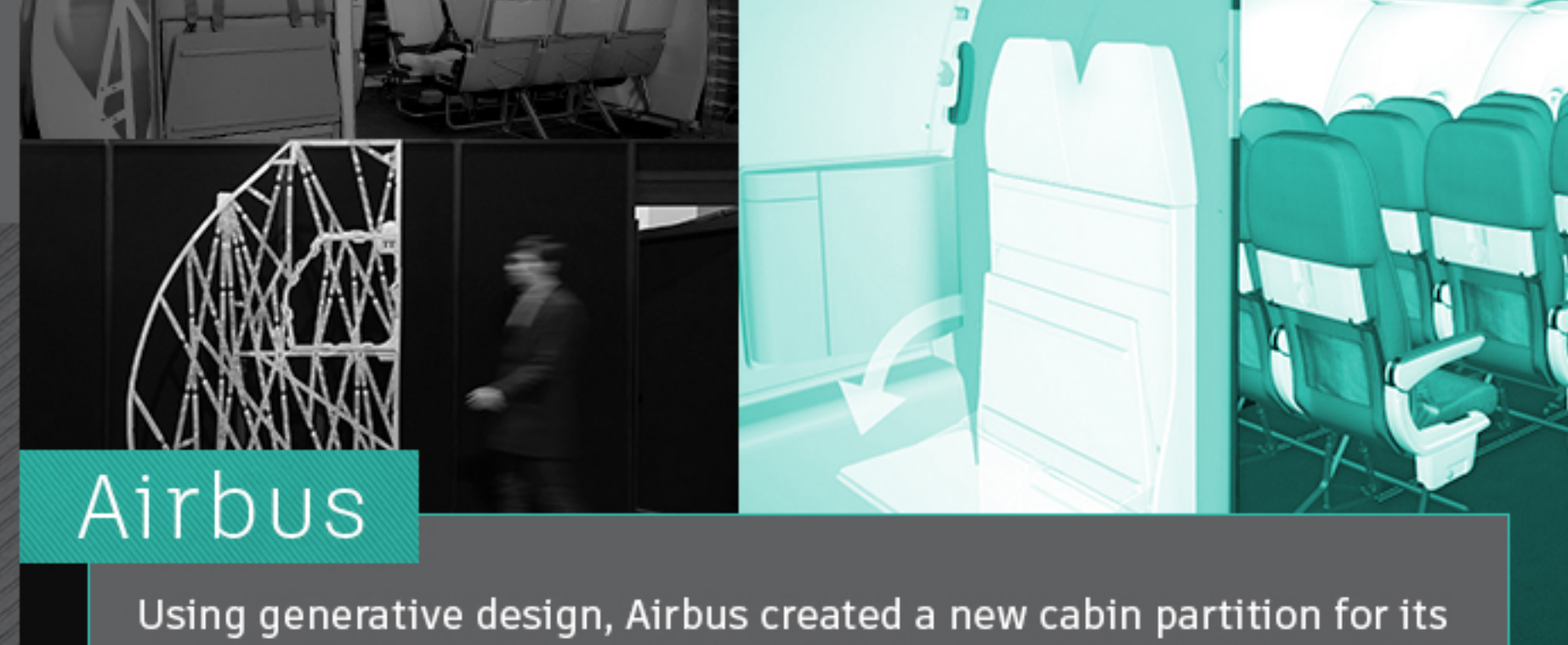
Step-by-step process

1. Designer/engineer inputs design goals and constraints, using a generative-design system like Project Dreamcatcher. Human enters specifics such as material type, weight, strength, and cost.
2. Computer uses algorithms and its own reasoning to generate 1,000s of designs, running performance analysis for each.
3. Designer/engineer studies options and modifies goals and constraints. Computer regenerates. Human intuition and computational artificial intelligence (AI) identify most relevant solution.
4. Designer/engineer fabricates the prototype, by milling or 3D printing, and returns to step 3 as needed.

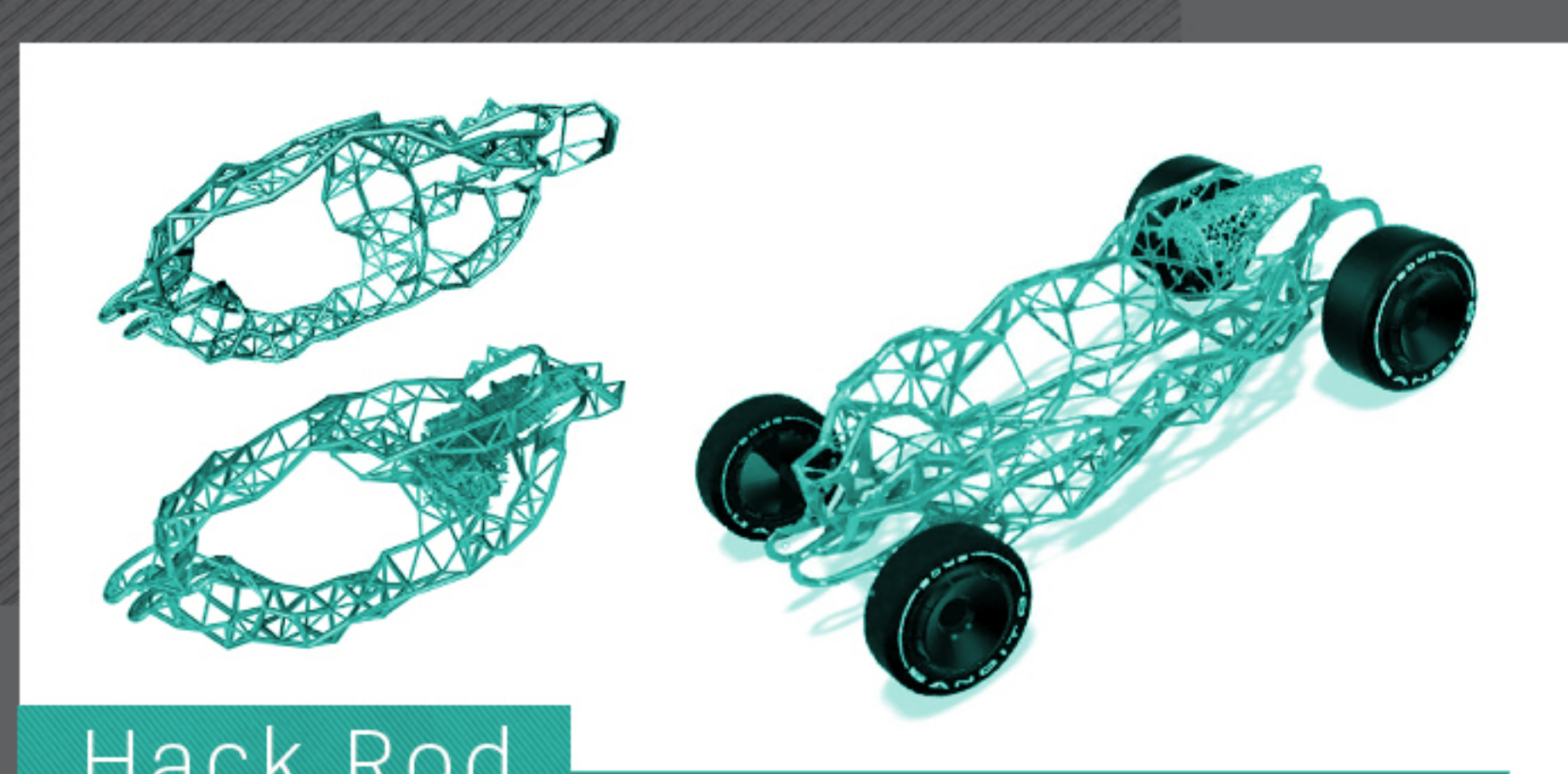
high-five!



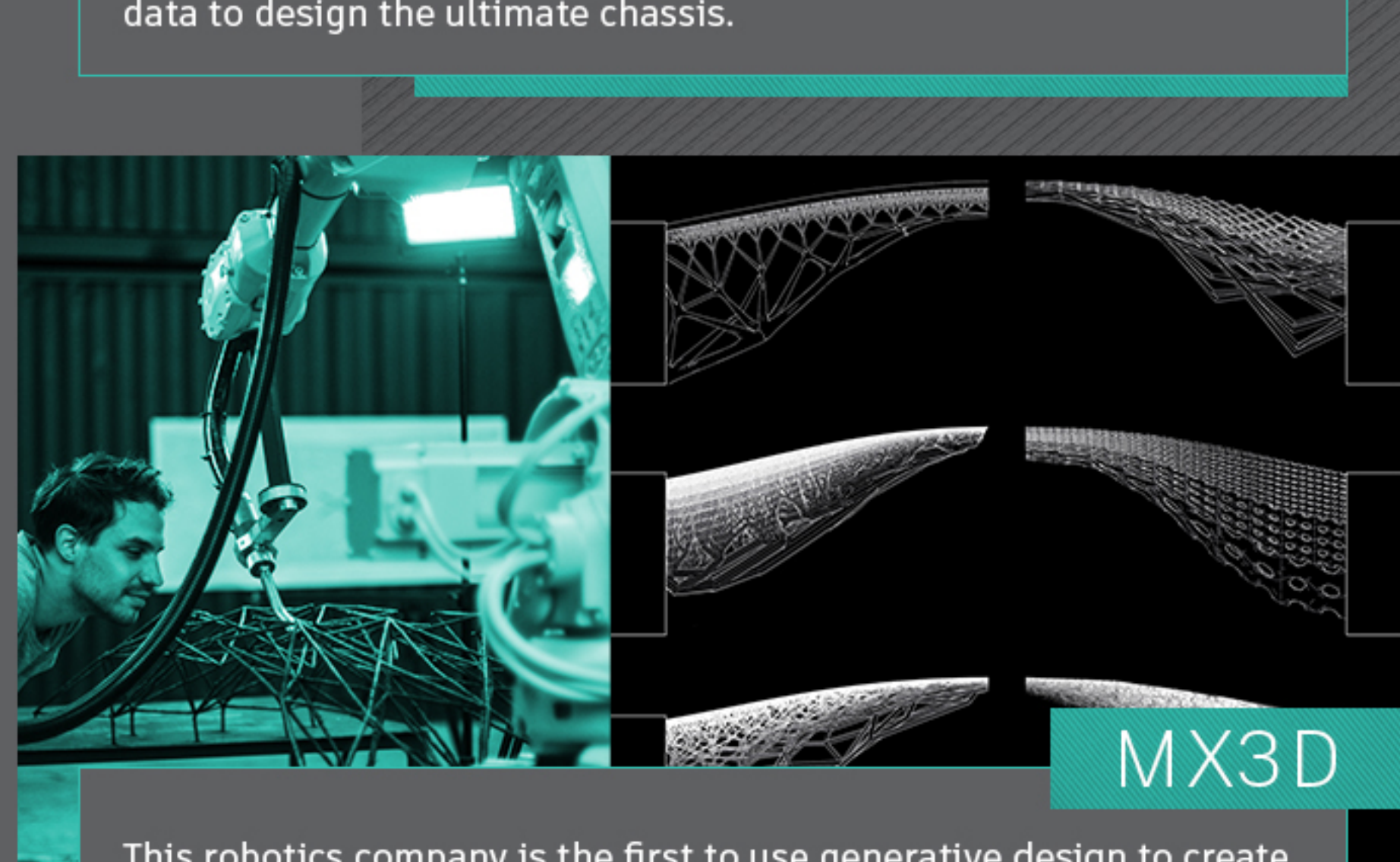
How is generative design used today?



Airbus
Using generative design, Airbus created a new cabin partition for its A320 plane. Designed by mimicking natural growth processes, the partition is stronger than the original yet half the weight.



Hack Rod
Outfitted with dozens of sensors and driven to the limit, Hack Rod's racecar generated billions of data points. Dreamcatcher used that data to design the ultimate chassis.



MX3D
This robotics company is the first to use generative design to create a bridge, which 3D-printing robots will manufacture to span a canal in Amsterdam.



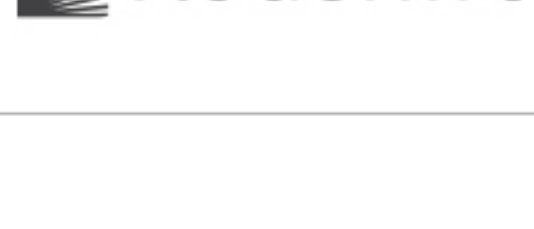
Under Armour
Using Autodesk Within software for generative design, the sportswear company generated the lattice structure for its 3D-printed Architech shoe. Within optimized for stability and cushioning, combining two shoes into one.

How will it change the world of design?



It will ...

1. **Save time:**
In the time a human can create a few designs, a computer can generate 1,000s, along with data to prove which designs are performance-based frontrunners.
2. **Boost creativity:**
Creating 1,000s of ideas, generative design opens new doors for designers and engineers to explore nontraditional forms they couldn't have imagined alone.
3. **Save money:**
Simulation and testing are baked into the initial design process, preventing expensive changes later in the manufacturing process.
4. **Create novel geometry:**
Generative design software makes generating this complex geometry possible, and 3D printing enables fabrication of objects that would otherwise be impossible to make.



Sources:
<https://autodeskresearch.com/projects/dreamcatcher>
<http://www.airbusgroup.com/int/en/story-overview/Pioneering-bionic-3D-printing.html>
<http://hackrod.com/>
<http://mx3d.com/about/partners/autodesk/>
<https://www.underarmour.com>
<http://www.autodesk.com/products/within/overview>