

# INSTANT CARS

Forget custom sports rims, exhaust pipes and spoilers – create your dream vehicle from scratch with 3D printing.

By ALYWIN CHEW



**T**here's a small problem with automotive customisation – you can only do so much with a pre-determined body. For example, you can't tell the sales agent that you want a car with a silhouette like the Maserati Quattroporte, a front grille like the Bugatti Veyron and headlights shaped like those on an Aston Martin Vanquish. But thanks to the advancement of 3D printing technology, you may soon be able to create your wildest automobile fantasy. From scratch.

Created in the mid-1980s by an American



are derived from Twizy, Renault's electric car.

"There are many places where 3D printing is not only limited, but not appropriate as a construction method. Tyres, windshields and wheels are particular places where DDM (direct digital manufacturing) is inappropriate," says Rogers.

Unveiled in 2014, the electric-powered Strati took just 44 hours to print and is capable of reaching speeds of up to 40km/hr. But though it looks like a buggy, it represents great promise for the future of automotive customisation.

## Thanks to the advancement of 3D printing technology, you may soon be able to create your wildest automobile fantasy.

named Charles Hull, 3D printing has since made significant inroads to becoming a viable source of manufacturing. A number of 3D printing start-ups have in recent times unveiled cars built using this technology, though these vehicles comprise mainly lightweight materials such as carbon fibre, plastics and aluminium alloy.

Admittedly, 3D printing technology as a production tool is still in its infancy, says John B Rogers, the CEO of Local Motors ([localmotors.com](http://localmotors.com)), widely recognised as the company that created the world's first 3D printed car, Strati. The majority of Strati was printed with ABS plastic and reinforced with carbon fibre, while its mechanical components

From above: Charles Hull; car parts are usually created using complex machinery and don't roll out from physical printers like this one. Facing page: Blade.

"The DDM process, of which 3D-printing is a part, brings reality to the elusive promise of customisation in the auto industry," says Rogers. "Local Motors is pushing the boundaries of DDM, such that not only the amount of customisation – but the pace of adoption of technology in the vehicle – evolves at an unprecedented rate."

And a rapid evolution is exactly what is happening. This June, Divergent Microfactories ([www.divergentmicrofactories.com](http://www.divergentmicrofactories.com)) unveiled Blade, the world's first 3D-printed supercar that goes from zero to 97km/hr in about two seconds – that's nearly the same acceleration as the Porsche 918 Spyder.

This Silicon Valley start-up






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boasts a patent-pending technology that could revolutionise the auto-manufacturing industry. Its CEO Kevin Czinger shares that the company’s unique approach connects 3D-printed aluminium nodes to carbon fibre tubing and panelling in a modular space frame structure, resulting in an exceptionally strong yet light chassis.

The Blade’s chassis weighs just 46kg but what’s even more astounding is that the entire car can be built in less than six hours.

As disruptive as this new technology may seem to traditional manufacturing processes, Czinger emphasises that his company’s objective is not to become the nemesis to automakers. Instead, he sees start-ups such as Divergent becoming suppliers of this new tech. “Over the long term, we believe this will change the economics of designing and building cars. Using our proprietary technology, an automaker could effectively use standardised construction modules to build a range of chassis types. The result

Some of the car parts that can be produced using 3D printing technology.

will be mass customisation of cars at volume,” says Czinger.

Many automakers have already been using this technology for years, though limited mostly to prototyping and conceptual work. Italian luxury carmaker Lamborghini ([www.lamborghini.com](http://www.lamborghini.com)), for example, uses 3D printing to produce a console component in its supercars. Bentley ([www.bentleymotors.com](http://www.bentleymotors.com)) uses the tech to print certain parts of dashboard panels. Lee Nian Tjoe, senior public relations manager of Audi Singapore ([www.audi.com.sg](http://www.audi.com.sg)), revealed that the marque’s plant in Ingolstadt, Germany, is testing a 3D printer that employs a laser melting process to produce metal components that normally cannot be created using conventional means.

One of the biggest obstacles in the way of having 3D-printed cars on the roads would be local laws and regulations, but Rogers is confident that this will not be a big issue. In fact, Local Motors claims that it will release its first batch of road-ready 3D-printed cars



Strati uses material science and advanced manufacturing techniques pioneered at the US Department of Energy.



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in 2016. A limited number of track versions of the Blade supercars will go on sale over the next 18 months, and Czinger notes that he does not see any obstacles in developing larger volume road-certified cars with other manufacturers.

Brad Balzer, the lead designer for the Blade project, mentioned earlier this year that the car had passed intensive stress tests. However, given the material composition of current 3D-printed cars, experts and law makers would naturally be sceptical about safety.

Singapore race car driver and automobile aficionado Yuey Tan is eager to check out this new breed of cars, but he does have his

reservations. "Obviously the different types of materials used to create a car contribute to safety levels, which is the most important part of the car. With the right engineering, it's certainly a very interesting proposition. I'm not sure I'd buy a 3D-printed car just yet but I'd definitely like to give it a test drive and see how it works."

So picture this: you visit an automaker in the morning to discuss the specifications of your desired car. You return later in the evening and drive away with your new, one-of-a-kind ride.

Sounds crazy? That's exactly what the future of bespoke cars looks like right now. 



Divergent Microfactories CEO Kevin Czinger poses while seated in a Blade supercar.