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26 September 2023, Page 9

两学府师生以昆虫为灵感 设计制造电动跑车外壳

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受昆虫生物结构和特性启发，本地两个学院的团队合作利用3D打印技术，设计和制造电动跑车的外壳部件，以简化安装和更换过程。

这个电动跑车项目由拉萨尔艺术学院及新加坡科技设计大学的师生合作。新科大的团队专注于跑车的底盘构建，拉萨尔团队则负责设计车身外壳。这个项目还处于组装阶段，但设计原型目前已在新加坡设计周展览上展出。

拉萨尔艺术学院的设计团队从昆虫的肢体结构和再生特性汲取灵感，运用3D打印技术制造车身外壳。参与项目的拉萨尔大二生钟翊涵说："如果仔细观察昆虫的结构，会发现大多数的昆虫由不同部位组成一个整体。此外，昆虫的一些部位具有再生特性，例如翅膀或腿断了会重新长出来。我们以此为灵感，通过3D打印制造跑车外壳的各个部件，以便更容易安装到底盘上。如果发生碰撞或损坏，只需重新打印损坏部件，使安装维修更简单。"

同样参与设计的拉萨尔大三生杨恩浩说，他们选用聚对苯二甲酸乙二酯（PETG）制作车身外壳。这种材料不仅坚固耐用，还能抵抗高温和紫外线。

新科大团队打造的底盘搭载了四电机电动动力系统，可在两秒内提速。为了减轻底盘重量，团队采用铝材构建车身框架。然而，由于铝材难以焊接，他们巧妙地使用3D打印接头（3D printed joint）的创意，确保铝质构件能够按照计算进行精准组装。

新科大教务处特殊项目顾问林世浚教授说："我们计划在明年初完成车身外壳的制作，并将所有部件安装到底盘上。"

拉萨尔艺术学院与新加坡科技设计大学的师生合作设计和制造电动跑车。拉萨尔艺术学院的学生设计团队包括杨恩浩（左起）、纳姆乔特，以及钟翊涵。（白艳琳摄）

LASALLE and SUTD teams come up with electric sports car with insect-inspired body shell

Drawing inspiration from the biological structures and characteristics of insects, members from two schools in Singapore have teamed up to design and produce an electric sports car whose body shell can be made by 3D printing to simplify the process of installation and replacement.

The project is a collaboration involving lecturers and students from LASALLE College of the Arts and Singapore University of Technology and Design (SUTD). The chassis was designed and built by the SUTD team, while the team from LASALLE designed the body shell. The project is currently in the assembly stage, but the prototype is now on display at the Singapore Design Week.

When the LASALLE team created the body shell using 3D printing, it based its idea on the anatomy and regeneration characteristics of insects.

"If you observe the insect anatomy, you will discover that the whole body of most insects comprises different parts. Besides this, some parts of an insect are regenerative. For example, when a wing or leg breaks off, it will regrow. Using this as our inspiration, we produced the various parts of a sports car body shell with 3D printing to make it easier to install on the chassis. In the event of collision or damage, we just need to print out the damaged part again which makes installation and maintenance easier," said Choong Yu Haun, a Year 2 student from LASALLE who is on the team.

His teammate, LASALLE Year 3 student Joel Yong, said that they chose to use polyethylene terephthalate glycol (PETG) to form the body shell as this material is sturdy and durable, and can withstand high temperatures and ultraviolet rays.

The quad-motor electric powertrain built by the SUTD team is capable of accelerating in two seconds. To reduce the weight of the chassis, aluminium was used for the car frame. However, as it is hard to weld aluminium, the team ingeniously came up with the idea of using 3D printed joints to ensure that the aluminium components can be precisely assembled as calculated.

“We plan to complete the body shell of the car early next year, and install all the parts on the chassis,” SUTD’s special projects advisor Prof Lim Seh Chun said.