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WORLDWIDE STUDENT DESIGN SHOWCASE 2018

AUTODESK.

BEST OF THE BEST
STUDENT DESIGN SHOWCASE

The Autodesk Education Team is delighted to present our global showcase for the 2017-18 school year. This showcase highlights the creative talent of some of the best and brightest students in the post-secondary market. These students represent the next generation of design and manufacturing leaders.

The designs in the book cover a wide range of implementation from prototypes that are currently being tested in market to very futuristic concepts that could be decades away. All of the students have utilized cutting edge Autodesk software to create these designs. As you explore them, we hope you come away excited and inspired by the future of making things.

Mary Hope McQuiston,
Vice President,
Autodesk Education Experiences

ÍKO SYSTEMS INC.

Sivan Sud
Micheal Eaton
Jason Ben Nathan
Erik Johnson

Cornell University

Okavango, by Iko Systems, is a tabletop appliance that grows culinary herbs. Designed for urban gourmets who live in seasonal climates, Okavango emphasizes flavor, design, and ease of use.

Through climate control, the system creates unique flavors by mimicking optimal growing conditions in different regions—so you can cook with Tuscan herbs while living in a concrete jungle.

Not only is Okavango functional, but it also serves as a design piece. The system fits seamlessly into any kitchen with its soft lighting and the varieties of wood stain.

The team at Cornell has done years of hydroponic research, designing a proprietary, closed pod. There is no mess and no nutrient dosing—users just place the pod into the system and add water weekly.

FUTURISTIC HELICOPTER

Kasra Tayebi

Arizona State University

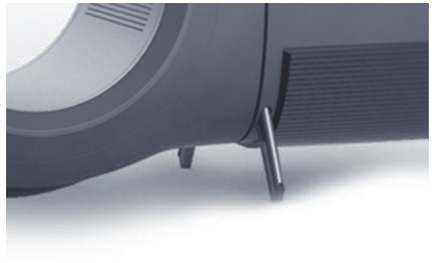
This helicopter design demonstrates the power of modeling with Autodesk® Fusion 360™. The student designer wanted to show the different dynamics of a fighter helicopter while utilizing the simple aesthetics of a passenger craft. He created the initial model by combining front and side sketches, then used his imagination and creativity to explore various shapes, ultimately resulting in the final 3D rendering.

ORRO

Ryan Burt

North Carolina State University

ORRO is the next step in safety and luxury for fully electric motorcycles. By integrating two 40-pound gyroscopic motors inside its frame, ORRO's design ensures that the motorcycle and rider remain safely stabilized upright even if hit. A 360-degree array of sensors allows autonomous driving, and a smart pre-collision system helps to prevent accidents. But just as important as the riding experience is the seamless modern aesthetic of this motorcycle. After much sketching and ideation, ORRO's designers created its smooth, distinctive look with the sculpt feature in Autodesk Fusion 360. The streamlined surface wraps around the innovative technology inside the vehicle, defining its shape and aerodynamic form.

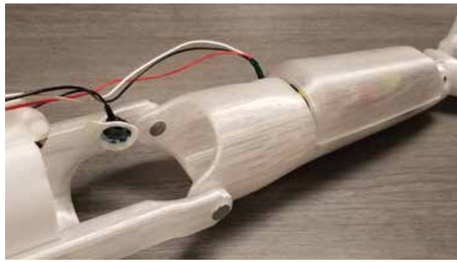


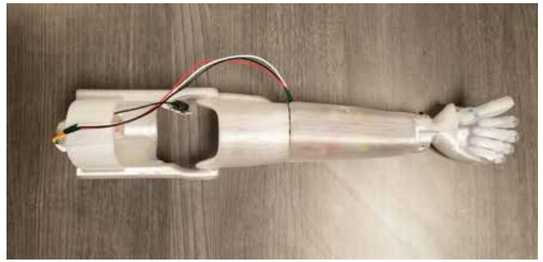
GROWING WITH NEUROPROSTHETICS

Michigan Neuroprosthetics Club
Aaron Chow

University of Michigan

The goal of the Michigan Neuroprosthetics team was to build an inexpensive neuroprosthetic device that could handle the continual growth of a child, enable a full range of motion, and be durable enough to withstand play. Through a combination of Autodesk® Fusion 360™ parametric modeling and sculpting, they achieved realistic fingers and a remarkable thumb and tendon-like structure. The natural grip of the hand was made possible through the additive manufacturing process. The device uses an EMG signal to receive data from the patient with which to control the hand's opening and closing. The finished product is made of only 10 parts (compared to 30–50 in a normal prosthetic) and is printed with PCTG, leading to a highly durable, chemical- and temperature-resistant device. The final device costs $100 to produce from scratch and is easy to customize, repair, or rebuild based on the child's growth and activities.





Lucas Lira

Fábrica de Nerdes

MODULAR SHELTER FOR LIFE

The Modular Shelter for Life is a sustainable housing resource to protect families. It is comfortable, flexible, easy to build, and most important, it offers a secure shelter for people who need protection in case of a natural disaster or another type of conflict that forces them to leave their home.

ELECTRON CYCLES V1

Jack Davies

Nottingham Trent University

The Electron Cycles V1 is a next-generation electric bike that combines a powerful 500-watt electric motor, to increase the range and speed of cycle journeys, and integrated smart features to make cycling a more attractive transport option.

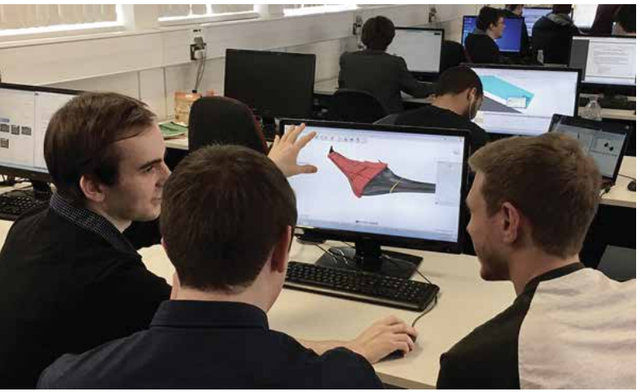
The frame is composed of an extruded aluminium profile, fixed with additive manufactured connectors, enabling bikes to be economically produced in any geometry, completely tailored to the rider. The electronics are integrated inside the frame, resulting in a clean aesthetic.

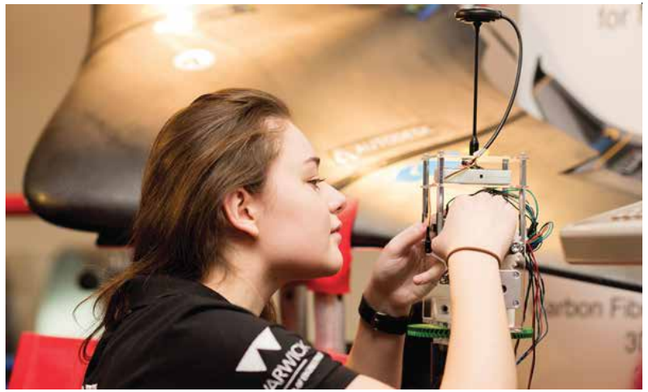
An OLED screen displays real-time information to the rider, including speed and battery life, as well as location information. Vibration motors in the handlebars also provide turn-by-turn navigation signals.

A smart lock is integrated into the frame of the bike, combined with the charger for simple and secure operation. The bike can be unlocked using a fingerprint or also using a key. Failsafe systems ensure the bike stays secure at all times.

UNMANNED AERIAL VEHICLE

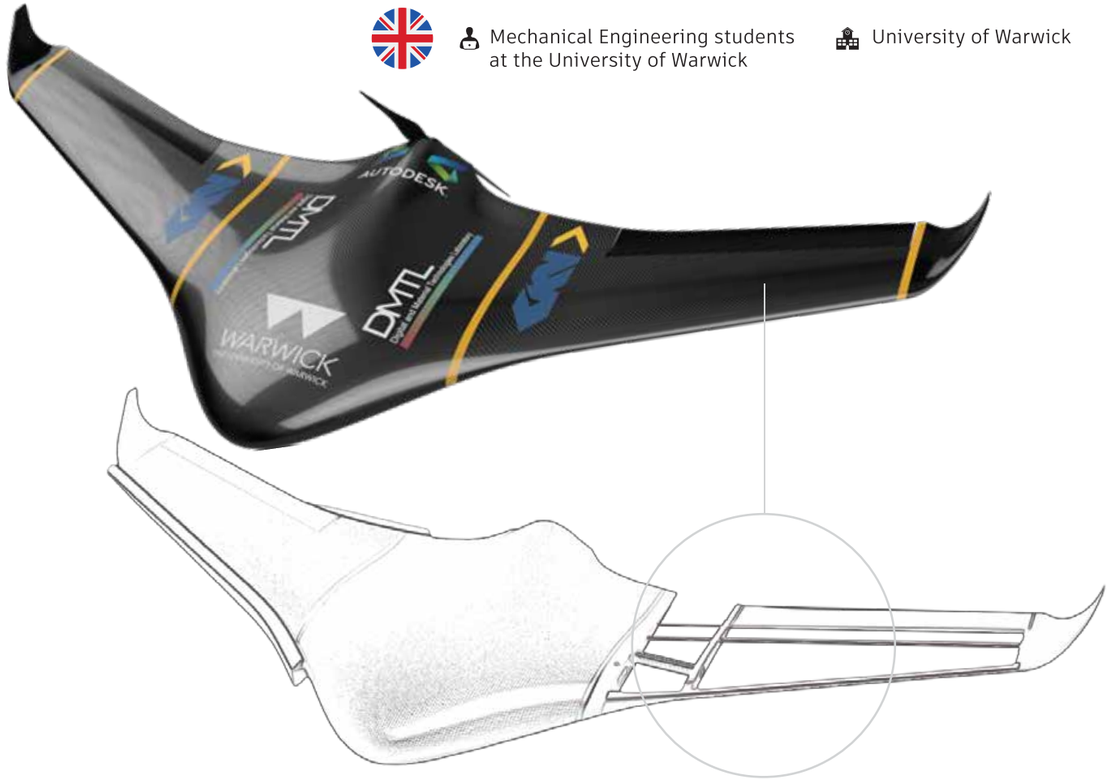
University of Warwick fourth year students have developed an Unmanned Aerial Vehicle (UAV) to aid in mountainside rescue as part of the UK government-sponsored program Horizon (AM), which aims to encourage the advancement of additive manufacturing in aeronautics. The goal for the drone is a payload of approximately 5 kilograms and 80-kilometre range. Made from carbon fibre composite, its wingspan is 2.20 metres (7.2 feet). Autodesk Fusion 360 was used to collaboratively design moulds for the UAV's fuselage, which were then printed on a large 3D format printer.



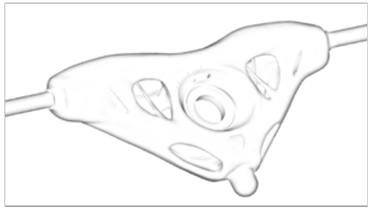


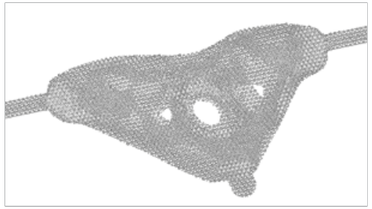
Mechanical Engineering students at the University of Warwick

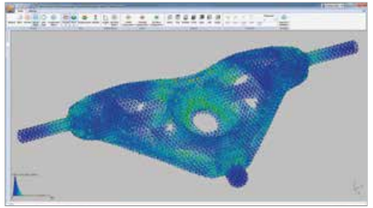
University of Warwick

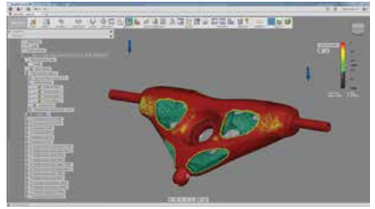


PROJECT T.O.S.T.









Philipp Manger University of Applied Sciences Jena

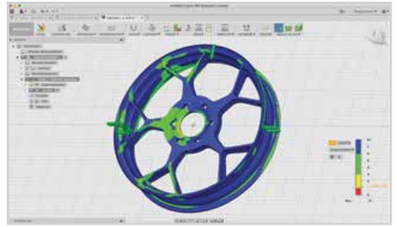
Project T.O.S.T. (Topology Optimized Skateboard Trucks) uses hybrid design and additive manufacturing to optimize the weight of titanium skateboard trucks. And designer Philipp Manger thinks that the principle of combining a bionic design with an internal lattice structure can transfer to many other applications that require lightweight design. Using Autodesk® SketchBook® Pro, Autodesk Fusion 360, and NetFabb® Ultimate software, Philipp created and tested the skateboard trucks himself in collaboration with Autodesk, Fraunhofer IWU, GE Concept Laser, and skatedeluxe. His design was a winner at 3D Pioneers Challenge 2017 and was shortlisted for the 2017 TCT Awards.

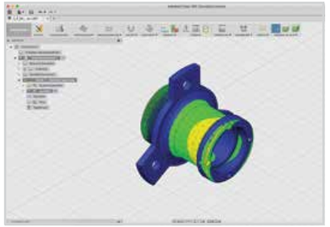
SONNENWAGEN AACHEN

Team Sonnenwagen Aachen

RWTH Aachen & FH Aachen

Sonnenwagen Aachen is a team of university students from Aachen, Germany, who used Fusion 360 to create a completely solar-powered car. In October 2017, they competed in the World Solar Challenge, a biennial competition in which groups traverse 3,000 kilometers through the Australian outback in vehicles powered by the sun and kinetic energy alone. Fusion 360 ended up being just the solution the student group needed. The platform not only enabled them to build and perfect the car from scratch, it also facilitated teamwork, so every member could collaborate, make changes, provide feedback, and keep up to date with what was happening with the project, no matter where they were.

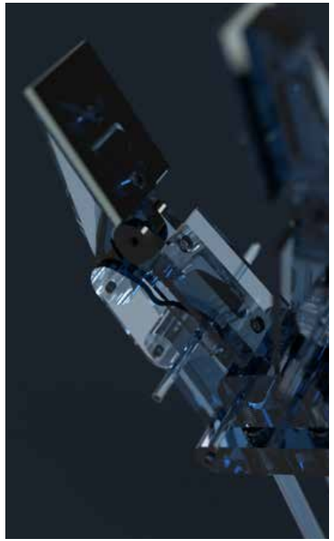


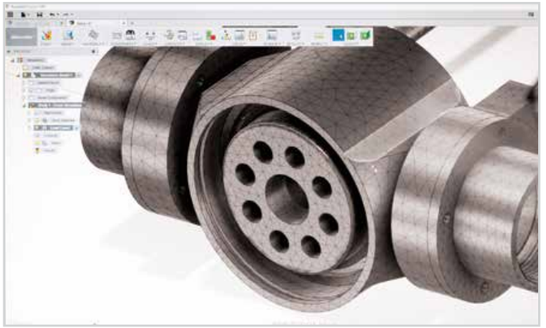


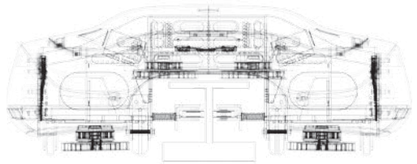
ITU ROVER

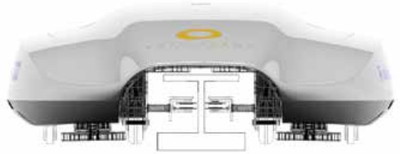
ITU Rover Team Istanbul Technical University

The ITU Rover Team is made up of more than 30 engineering students at Istanbul Technical University. The team works on unmanned land vehicles, focusing on Mars rover prototypes. Every year they represent Turkey at the University Rover Challenge, an international contest held by the Mars Society, and this year they used Autodesk software to create the motion mechanism and robotic arm for their next-generation rover.









In 2013 Elon Musk, the CEO of SpaceX, shared his vision for a next-generation high-speed ground transportation system called Hyperloop. To accelerate the development of functional prototypes, SpaceX announced the Hyperloop Pod Competition, inviting engineering teams from universities around the world to design and build a pod to run in a half-scale test tunnel. The first competition, held in January 2017, had over 1,200 entries, which were then narrowed to feature 27 prototypes.

The Keio Alpha team from Keio University in Japan, a finalist in the competition, chose Fusion 360 to create their pod design. Team members could share data via the cloud from their respective locations, enabling them to successfully complete their design within eight weeks. The team's vision was to realize the futuristic idea of "live anywhere, work anywhere, be anywhere." Keio Alpha's pod won accolades from SpaceX because of its compact size and feasibility.

Keio Alpha Keio University

HYPERLOOP POD

LUNAVITY

Introduction

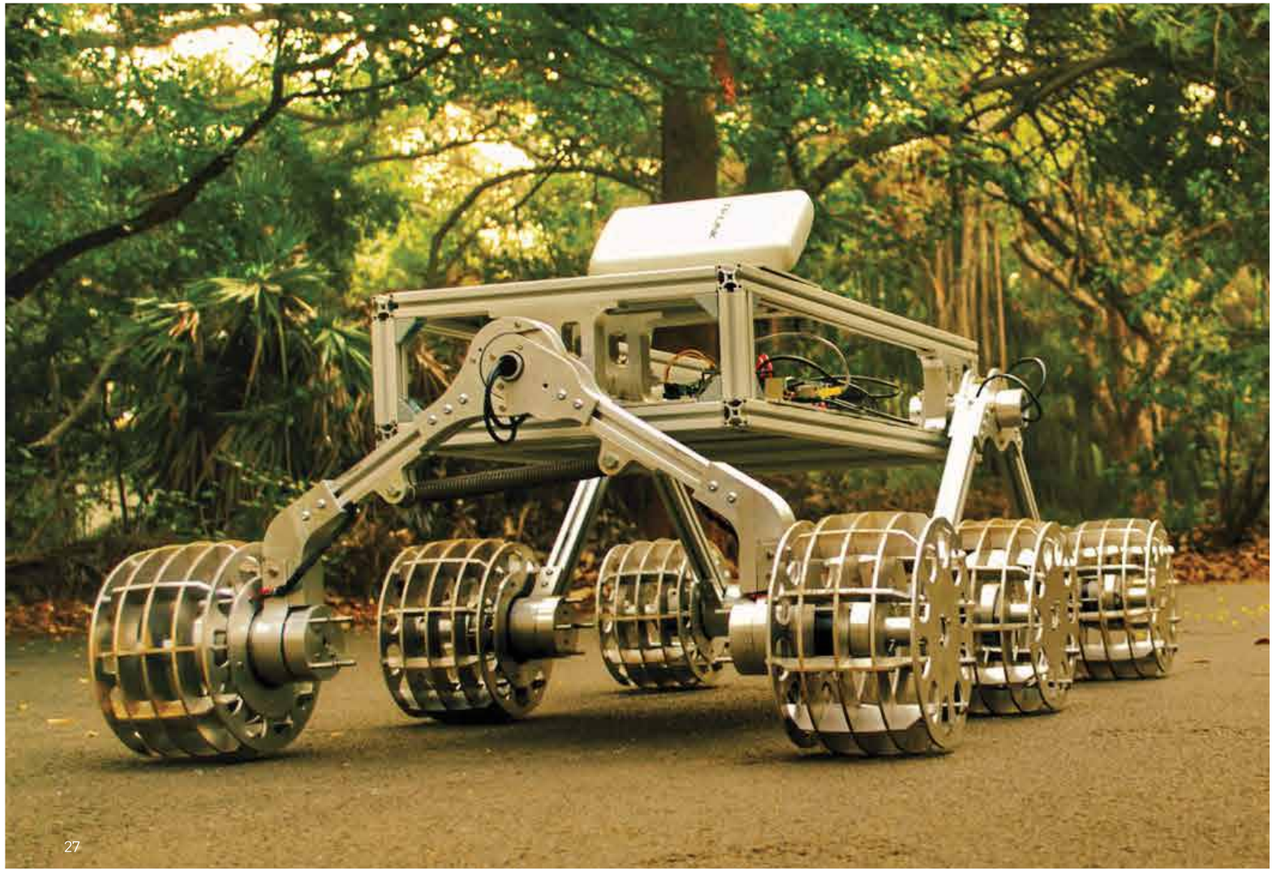
Video

Takumi Takahashi
Keisuke Shiro
Akira Matsuda
Hayato Nishioka
Yuuki Ogasawara

The University of Tokyo

Lunavity is a backpack multirotor that aims to augment the ability to jump by simulating reduced gravity. The device is installed on your back, supporting body weight and generating thrust power with 16 electric ducted fans—helping you jump higher and stay in the air longer.

Unlike with other flying devices or jetpacks, users of Lunavity will experience simulated reduced gravity, to create the feeling of walking on Mars or the Moon. The University of Tokyo team that created Lunavity envisions a future where Jump Augmentation will help people play new types of sports and easily move around with intuitive control.



MARS ROVER

Team Anveshak

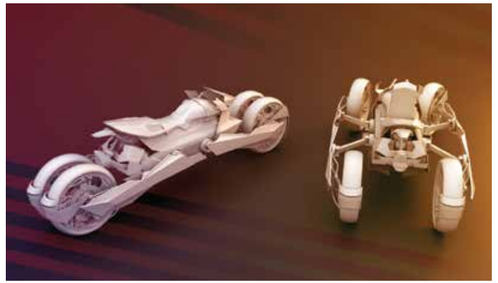
Indian Institute of Technology Madras

Team Anveshak designed the Mars Rover to work alongside astronauts on the red planet. It can perform several tasks, including autonomously traversing uneven terrain, performing soil analysis, and servicing equipment that tests its mechanical and electrical capabilities. The team set out to create a modular, low-cost all-terrain rover that could be used for various missions, such as defense, reconnaissance, and search and rescue.

FUTURISTIC BIKE EXPLORER

Mayank Gala DSK ISD Rubika International Campus

This futuristic cycle was designed for enthusiastic adventurers who want to discover unexplored places. Not just a fast bike, this rangerlike quad-bike can effortlessly explore uneven terrain where regular vehicles cannot go. Inspired by video games and sci-fi stories, This design was a winning entry at the Honda Design Competition held in Bangkok, Thailand.



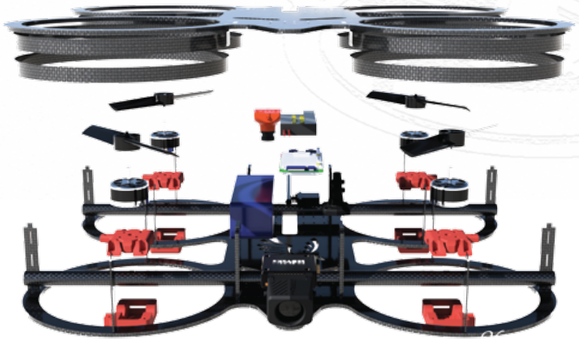
RAVEN

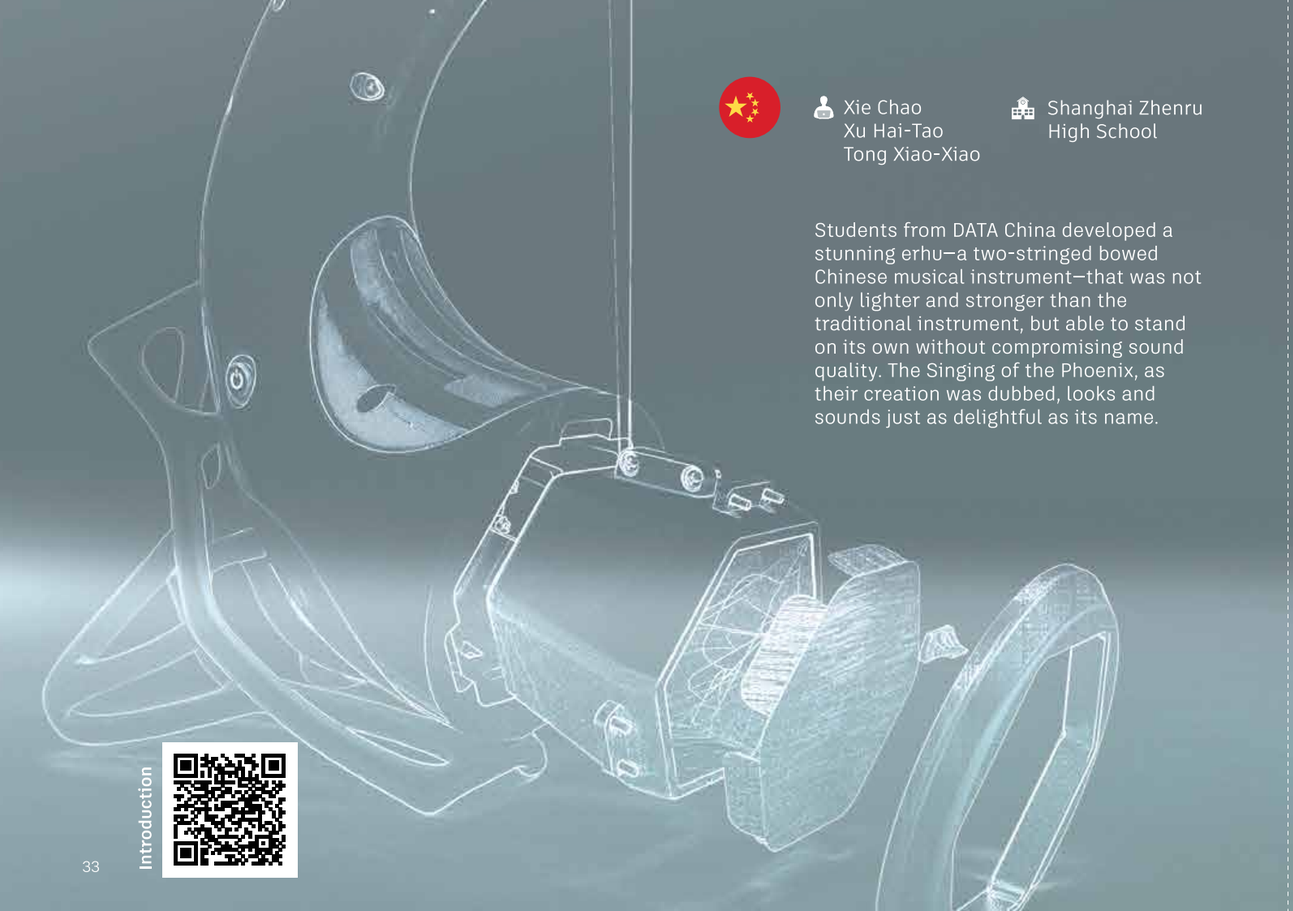
Video

Vishal Ramanathan

Singapore University of Technology and Design

In designing Raven, a semi-autonomous drone for search and rescue of victims of natural disasters and chemical sample collection operations, students at SUTD created a carbon fiber chassis for durability and increased payload-carrying capabilities. The motor mount was custom 3D printed, and an ultrasonic sensor array helped ensure collision avoidance and altitude holding. They used Autodesk® Eagle™ software to design printed circuit boards (PCBs) to simplify trouble shooting of electronics connections and easily integrate the collision avoidance system.





Xie Chao
Xu Hai-Tao
Tong Xiao-Xiao

Shanghai Zhenru
High School

Students from DATA China developed a stunning erhu—a two-stringed bowed Chinese musical instrument—that was not only lighter and stronger than the traditional instrument, but able to stand on its own without compromising sound quality. The Singing of the Phoenix, as their creation was dubbed, looks and sounds just as delightful as its name.

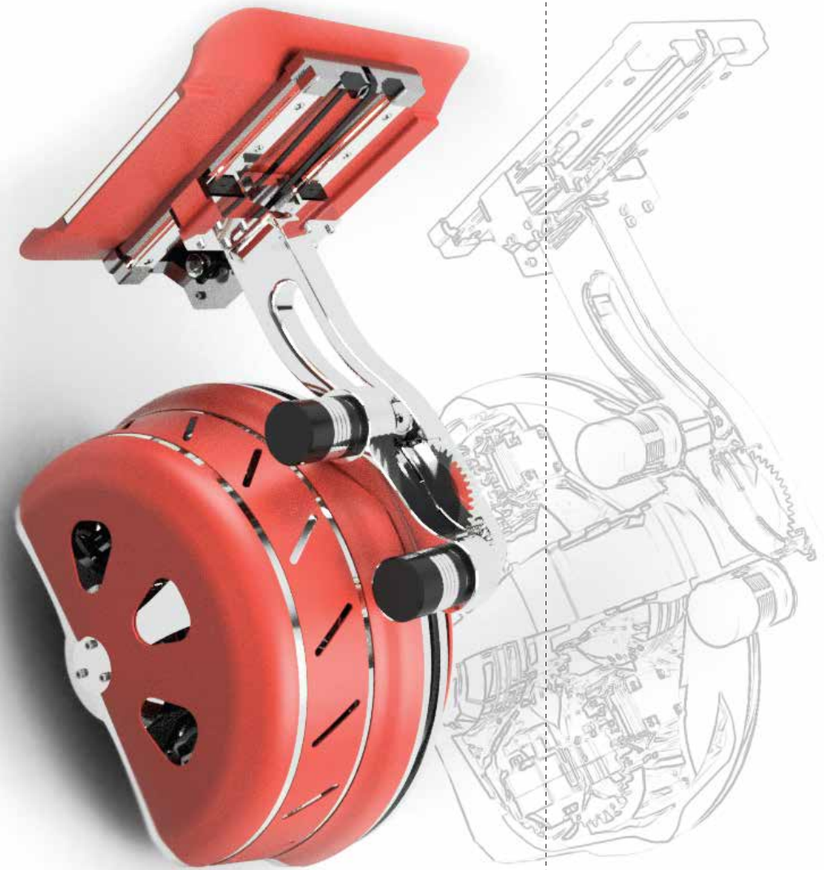
THE SINGING OF THE PHOENIX

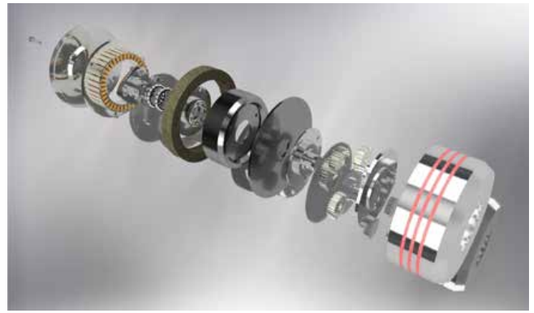
SNAIL ROBOT

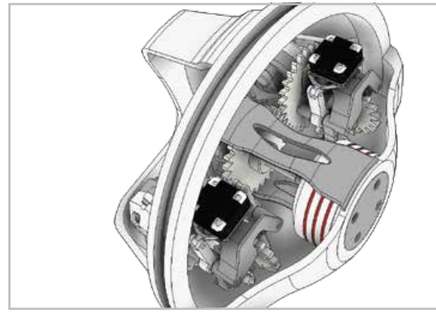
Sun Zhi-Jin
Li Kui-Bing
Zheng Hao

Hefei University of Technology

This snail robot can transport food from a warehouse to your kitchen, and then deliver meals from kitchen to table. The robot is designed to perform a number of duties: it can wait next to the table, adjust the speed of delivery, change direction, and track its path to avoid colliding with other snails.





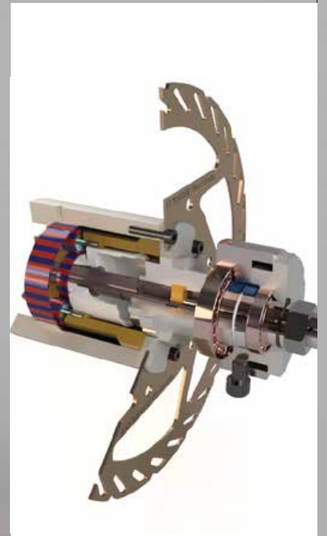


BURN ENEMY

Chen Yingyou Far East University

Chen Yingyou from Far East University, Taiwan, envisioned an electric guitar design that would never go out of style—and Burn Enemy was born. Inspired by Japanese Ukiyo-e elements as well as the charming dance of crackling flames, the hollow model electric guitar was created with CNC machine milling.

SELF ASSISTED VARIABLE SPEED WHEELCHAIR



Wu Tz-Chang
Chen Jun-Rong

National Yunlin University of Science and Technology

This self-assisted wheelchair can change its internal transmission speed to fit different environments. Triple-wheel legs are set at both the front and back of the chair to help users avoid obstacles and maintain self-reliance.