JUNE

2018

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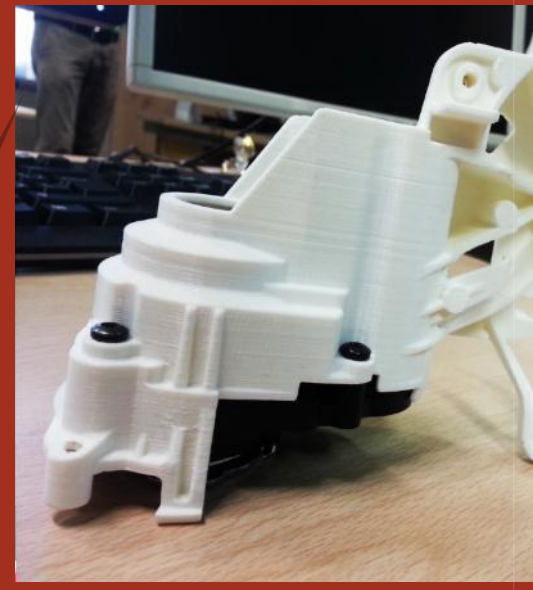

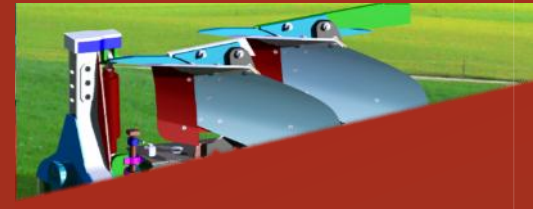

DAuto Newsletter 106th Edition

Edition 2018

"Design engineers turn designs into reality. Without them, a great idea but nothing more than,... well, a great idea."

May 2018 refresh

- ✓ *Giugiaro Sibylla Concept*
- ✓ *Mit Graduates Create World's First 'Robotic Kitchen'*
- ✓ *Internet-connected Sensors Provide Concrete Data*
- ✓ *Meet The Rebar Robot*
- ✓ *Curtiss Zeus Concept Is A Futuristic Electric Motorcycle*
- ✓ *Cheap 3-D printer can produce self-folding materials*
- ✓ *Mercedes-AMG GT S Roadster*
- ✓ *IBM To Invest In Tech To Predict Floods, Cyclones In India*

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Porsche 911 Speedster Concept

To celebrate its 70th Anniversary, Porsche has unveiled the 911 Speedster Concept, a production-ready concept inspired by the brand's iconic speedsters of the past.

Unveiled during the opening ceremony of the "70 Years Porsche Sports Cars" exhibition at the Porsche Museum di Zuffenhausen, the Porsche 911 Speedster Concept features a widened body derived from the 911 Carrera 4 Cabriolet, while the wings, front hood and rear cover are made of lightweight carbon-fibre composite material.
wo contrasting black slats between the 'humps' add an aerodynamic touch, and a transparent Plexiglas wind deflector features an engraved '70 years of Porsche' logo. A special rear cover made of carbon fibre connects behind the front seats, covering a roll-over protection structure and featuring a 'double bubble', a traditional element of this sports car design since the 911 Speedster from 1988.

The wide B-pillars and the rear are decorated with milled, gold-plated Speedster lettering.
Like the historic original, the 911 Speedster Concept also features a lightweight tonneau cover instead of a convertible top. This cover protects the car interior from rain when parked, and is attached using eight Tenax fasteners.

The paintwork in the traditional colors of GT Silver and White harks back to Porsche's early racing cars – as do many of the other carefully crafted details, such as the 50s-style central fuel tank cap positioned in the middle of the front bonnet, the classic Talbot shape of the exterior mirrors or the unique design of the main headlights.

The transparent and opaque surfaces on the headlight covers produce a cross-like effect and are nod to a practice prevalent in Porsche's early years in motorsport: tt the time, the original headlights were taped before races to protect them against stone chipping and to prevent the glass from shattering.

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Porsche 911 Speedster Concept

The characteristics of the 911 Speedster Concept include the shorter window frame with a more inclined windscreen and correspondingly shortened side windows.

These features give the sports car study an even stockier profile with a very low fly line, which is reminiscent of its predecessors such as the Porsche 356 1500 Speedster.

The concept study offers a glimpse of a potential series-production version, although this model may not be presented until 2019. A decision on whether to move ahead will be made in the coming months.

Interior Design

The lightweight principles of the Speedster philosophy continue through into the interior, where the navigation, radio and air conditioning systems have all been eliminated.
The full bucket seats are made of carbon, and the light brown Aniline leather covers in Cognac 356 pick up on features from the car's classic predecessors.

Technical Features

Below the bodywork, the 911 Speedster Concept features a chassis borrowed from the 911 GT3.
The 21-inch rims in Fuchs design feature contrasting high gloss polished clover-leaf details and center locks
The GT developers also contributed the exhaust system with titanium tailpipes and the powertrain, which includes a six-speed manual transmission.
The six-cylinder flat engine in this minimalist concept study delivers over 500 hp and reaches speeds of up to 9,000 rpm.

The Porsche Speedster heritage

The history of Porsche Speedster models begins in the USA Speedster variants of sports car models, which combine open-top driving pleasure with incredibly distinctive driving dynamics, have been part of the Porsche company history since 1952.

The forefather of Porsche Speedster models, the 356 1500 America Roadster, had an aluminium body manufactured entirely by hand.

It weighed 60 kilograms less than the 356 Coupé and its top speed of 175 km/h with its 70-hp four-cylinder flat engine was an impressive feat at the time.

Featuring slot-in windows for the doors, a folding rain- cover top and lightweight bucket seats, this car developed exclusively for the US market was built just 16 times and already embodied several key elements of the Speedster design.

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This Supercomputer Can Calculate in 1 Second What Would Take You 6 Billion Years

To keep Summit from overheating, more than 4,000 gallons of water pump through its cooling system every minute, according to Oak Ridge National Laboratory where the beast is housed.

It's shiny, fast and ultrapowerful. But it's not the latest Alfa Romeo. A physics laboratory in Tennessee just unveiled Summit, likely to be named the world's speediest and smartest supercomputer.

Perhaps most exciting for the U.S.? It's faster than China's.
The supercomputer — which fills a server room the size of two tennis courts — can spit out answers to 200 quadrillion (or 200 with 15 zeros) calculations per second, or 200 petaflops, according to Oak Ridge National Laboratory, where the supercomputer resides.

"If every person on Earth completed one calculation per second, it would take the world population 305 days to do what Summit can do in 1 second," according to an ORNL statement.
Put another way, if one person were to run the calculations, hypothetically, it would take 2.3 trillion days, or 6.35 billion years. [9 Super-Cool Uses for Supercomputers]

The former "world's fastest supercomputer," called Sunway TaihuLight, can perform 93 quadrillion calculations a second (93 petaflops), while humming away inside China's National Supercomputing Center in Wuxi.
So, how did Summit become such a giant?

The supercomputer is an IBM AC922 system that's made up of 4,608 computer servers — each comprising processors (the brains of the computer). But what's actually going on inside these processors is what makes the difference.

"Summit's computer architecture is quite different from what we have had before," Daniel Jacobson, a computational biologist at ORNL, who is working on Summit, told Live Science. For one thing, the computer uses the new Tensor Core feature in its graphics cards (made by Nvidia), which is designed specifically for applications focusing on machine learning and artificial intelligence (AI), and to be fast.

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This Supercomputer Can Calculate in 1 Second What Would Take You 6 Billion Years

Summit's placement as the "world's fastest" isn't exactly official yet, because the Top500 list for supercomputer rankings hasn't been updated yet, but according to the Times article, it should get the top slot when the list is updated later this month.

Basically, unlike older computer chips, these chips are optimized for a special type of mathematical operation on matrices — or rectangles filled with numbers with rules for adding, subtracting and multiplying the different rows and columns. Computers equipped with AI programs often learn using so-called neural networks, which have several layers in which lower calculations feed into higher ones. And this process requires the heavy use of matrices.

"This is a brand-new feature that has allowed us to break the exascale barrier," Jacobson said, referring to a processing speed that's over a billion billion calculations per second. In addition, Summit has loads of superfast memory (RAM) available on each of its nodes, where localized calculations can take place.
"Each node on Summit has 512 Gb [gigabytes] of RAM and the network that communicates between nodes uses adaptive routing, and is thus incredibly fast, which helps us scale the calculation across all the nodes very efficiently," Jacobson said. So-called adaptive routing means Summit has some flexibility in how it runs calculations — sort of like networks of brain cells connected to synapses.

And though pricey — a New York Times report puts the cost at $200 million — Summit could deliver big for science: The supercomputer is built to integrate artificial intelligence into its computing, which could make Summit a formidable foe in the battle for answers to some of the world's most complex mysteries.
"There are many, many scientific uses of this sort of supercomputing capacity," he said. "Whether this is for new discoveries for bioenergy or new discoveries for precision medicine, many things are now possible that simply weren't before."

For instance, just as artificial intelligence programs are being co-opted to learn to pick out cats from images, said Jack Wells, the director of science at ORNL, these AI programs running on Summit could learn to pick out and categorize all kinds of data, ranging from those in biological sciences to physics, such as detections of neutrinos and other particles.
"Something new that's happening, is it's going to be at the intersection of machine learning and simulation science, because this machine is going to be able to do both of those things in a very significant way," Wells told Live Science.

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Stantec To Lead Environmental Assessment For Offshore Maryland Wind Farm

Edmonton, AB; New York; Ocean City, Md. — Stantec was selected to lead environmental assessment for the Skipjack Wind Farm, an offshore wind project being developed by Deepwater Wind off the coast of Maryland. Deepwater Wind is the only company to fully build and operate an offshore wind farm in the United States, the Block Island Wind Farm located off the coast of Rhode Island.

Deepwater Wind's 120-megawatt Skipjack Wind Farm is Maryland's first offshore wind farm, with the potential to deliver enough renewable energy to power 35,000 Maryland homes.
Stantec, which has a team based locally in Laurel, Md., along with technical and regulatory experts along the East Coast, will lead a team of local biologists, engineers, marine archaeologists, and other researchers to conduct extensive marine and environmental assessments. Stantec is supported by Maryland-based environmental firms to facilitate the project's state and federal permitting efforts.

"We are committed to supporting Deepwater Wind through a streamlined and thorough process in the assessment and permitting of this milestone renewable energy project," said Diane Sullivan, sector leader for Renewable Energy at Stantec. "With the ongoing expansion of the off-shore wind energy sector along the East Coast, the Stantec team provides a unique set of skills and expertise to support clients in the planning and delivery of such complex energy generation projects. Stantec brings over 30 years' experience in wind energy project development, permitting and marine systems, coupled with a diverse local team of environmental specialists and scientists, to deliver comprehensive, tailored guidance and project solutions."

Deepwater Wind has secured the rights to acquire the site's federal lease, with the Maryland Public Service Commission designating the Skipjack Wind Farm a "Qualified Offshore Wind Project" in May 2017.

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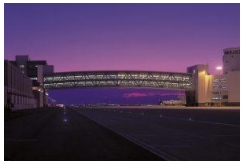
Denver International Airport Passenger Bridge Celebrates 25th Anniversary

An all-glass curtain wall system encloses the bridge providing a panoramic view of Colorado's diverse environments with the Rocky Mountains visible to the West and the plains to the East.

"This team did a wonderful job of creating something never before built, in a condensed timeframe to support Denver's globally-renowned airport. That the project has remained virtually un-touched since its construction is a real testament to the talent that brought this project to life," said Brian Holland, with Mortenson Construction.



Denver — The Denver International Airport (DEN) is celebrating the 25th anniversary of the construction of its Pedestrian Bridge, one of only two of its kind that are built in the world today. The bridge connects the Main Terminal with Concourse A, with a security portal on its lower deck and international customs accessed on its upper level. Constructed in 1993 in an effort to offer a pedestrian alternative to the new airport's inter-terminal train system, the bridge was a widely acclaimed design feat for its time.

"This project was incredibly sophisticated. This was the first time a passenger structure had been built in the world large enough to allow for planes to travel underneath. And at a length of 365 feet, we designed it so two planes could pass under it side-by-side," said Luis O. Acosta, the Architect of Record who led the project's design.

Built as its own freestanding structure, the 40-foot wide, 365-foot long passenger bridge was designed by LOA Architecture (previously Luis O. Acosta Architects). Other design team members included the structural engineer and prime consultant LONCO (now operating as Benesch), mechanical engineer Behrent Engineering, and electrical engineer Roos/Szynskie. The bridge was built by M.A. Mortenson Company. The project's construction took less than 12 months, and at the time the bridge was built, it is still currently the longest free-span airport bridge in the U.S.

The bridge, not originally included in the airport's master plan, was added after the main Terminal and Concourse A had already been constructed. Since the two buildings did not align at the same height, and were not designed to connect, the architects were tasked with the further challenge of creating an arc that would be both structurally sound and visually appealing. A further challenge to the project, of course, were FAA restrictions that required a clearance distances from the top of the runway to the underside of the bridge as well as consideration for the bridge's deflection under various loading conditions.

Further challenges the team had to address included creating a structure that did not allow icicles to form, which could cause damage to planes passing underneath, and supporting the massive, two-level bridge when the underground passenger train ran directly underneath causing regular vibrations.

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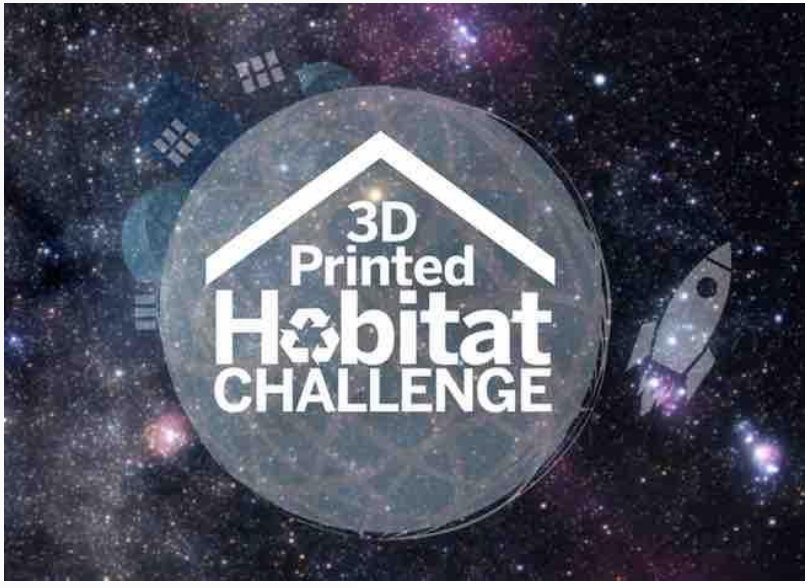
NASA Challenge Team Advances to the Top 10

As the 3D-Printed Habitat NASA Centennial Challenge has proceded into Phase 3 - Virtual Construction, Northwestern's team has proceded to the top 10! There were 18 submissions for the competition from industry and academia, and they have now been narrowed down to 10.



Through four distinct competition phases, NASA's 3D-Printed Habitat Challenge will stretch the body of knowledge surrounding 3D-printing applications. Taking place 2015-2017, Phase 1 and 2 challenged industry and academia to develop conceptualizations of the first Martian outpost and 3D-print a column, beam, and small roof section using materials found on Mars. Now in Phase 3, the teams are taxed with fully designing a constructible Martian habitat and 3D-printing a foundation, walls, and a 1:3 scale habitat...all in under 16 months.

The plan is to approach this challenge as several parallel competitions. Rather than proceeding from habitat design, to material design, to 3D-printer design, etc, NU's team is having sub-teams investigate each challenge aspect simultaneously. While from initial perspective this challenge appears of significant difficulty, Northwestern is in a prime position to perform successfully.

In past years, Northwestern students and faculty have investigated the feasibility of Martian regolith as a building material and developed one of the first Martian concretes. Northwestern Mechanical Engineering has numerous faculty working on additive manufacturing and a team of students recently developed a working concrete 3D-printer. In addition, the Earth and Planetary Sciences Department sets Northwestern at a significant advantage due to the number of Mars experts at such easy access.

Northwestern's 3D-Printed Martian Habitat Team comes from a greatly varied background; not only is the project interdepartmental, but it also spans multiple colleges within the university. Even in this early stage, the team is composed of students and faculty from the Department of Chemical and Biological Engineering, Department of Civil & Environmental Engineering, Department of Earth and Planetary Sciences, Department of English, Department of Materials Science and Engineering, Department of Mechanical Engineering, Department of Political Science, and the Medill School of Journalism.

Along with the diverse backgrounds, they also bring a wide variety of expertise; with 17 students (ranging from Undergraduate to PhD), 8 faculty members, and 1 staff member. In addition, they have partnered with Skidmore, Owings & Merrill (SOM), one of the world's largest and most influential architecture, engineering, and urban planning firms, to assist in design and all areas of the competition. The team is led by Prof. Gianluca Cusatis, who is the faculty advisor, and Matthew Troemner, a PhD student in Northwestern's Civil and Environmental Engineering Department.

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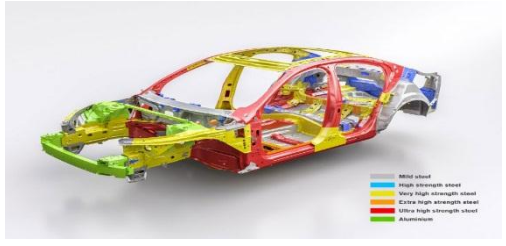
Volvo reveals US-built S60 sedan







Volvo has revealed the new S60 mid-size sedan, that will be built in South Carolina and will be Volvo's first car without a diesel offer.

Volvo has revealed the new S60 mid-size sedan, that will be built in South Carolina and will be Volvo's first car without a diesel offer.

The model is the first Volvo car to be sold without a diesel offer, signaling the company's commitment to electrification and a long-term future beyond the traditional combustion engine.

Compared to the S90, the S60 has a more athletic side view thanks to the character line that defines the rear shoulders and the more angled bottom contour of the rear windows Like the V60 estate model presented earlier this year, the new S60 is based on Volvo's Scalable Product Architecture (SPA) platform.

Among the onboard systems are the City Safety with Autobrake technology – capable of recognizing pedestrians, cyclists and large animals – and the optional Pilot Assist system – which supports the driver with steering, acceleration and braking on well-marked roads up to 80mph.

The Sensus Connect infotainment system is compatible with Apple CarPlay, Android Auto and 4G, and is controlled through a tablet-style touchscreen interface that combines car functions, navigation, connected services and in-car entertainment apps.

Two turbocharged and supercharged plug-in hybrid gasoline engines will be available in the new S60: Volvo's T6 Twin Engine AWD plug-in hybrid that generates a combined 340hp, and the award-winning T8 Twin Engine AWD plug-in hybrid that delivers 400hp. Volvo's T5 and T6 gasoline engines will be available at launch in selected markets.

Electrified versions of the new S60 also offer a performance handling upgrade called Polestar Engineered – developed by Volvo Cars' electric performance arm, Polestar.

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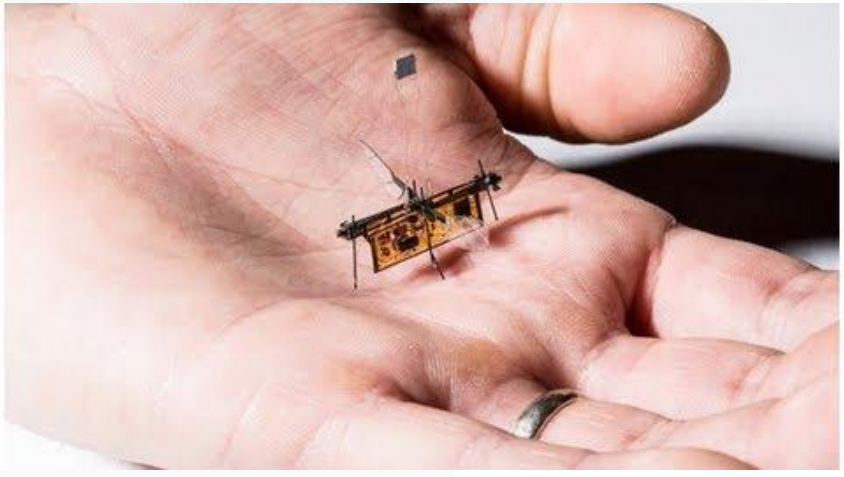
Wireless 'RoboFly' Looks Like an Insect, Gets Its Power from Lasers



"I'd really like to make one that finds methane leaks," he said. "You could buy a suitcase full of them, open it up, and they would fly around your building looking for plumes of gas coming out of leaky pipes. If these robots can make it easy to find leaks, they will be much more likely to be patched up, which will reduce greenhouse [gas] emissions."

A new type of robot is so tiny and lightweight — it weighs about as much as a toothpick — it cflying an perch on your finger. The little flitter is also capable of untethered flight and is powered by lasers.

This is a big leap forward in the design of diminutive airborne bots, which are usually too small to support a power source and must trail a lifeline to a distant battery in order to fly, engineers who built the new robot announced in a statement.
Their insect-inspired creation is dubbed RoboFly, and like its animal namesake, it sports a pair of delicate, transparent wings that carry it into the air. But unlike its robot precursors, RoboFly ain't got no strings to hold it down. Instead, the miniature bot uses a lightweight onboard circuit to convert laser light into enough electrical power to send it soaring. [New Flying Robots Take Cues From Airborne Animals]

RoboFly's creators will present their findings about the robot on May 23 at the International Conference on Robotics and Automation, held in Brisbane, Australia. Animals' amazing abilities have inspired designs for robots that swim like manta rays, hover like jellyfish, jump like bush babies and even jog like humans. Prior to RoboFly, another insect-like bot, called RoboBee, demonstrated its ability to take off, land, hover and even perch midflight to conserve energy.
But RoboBee was leashed to its power supply and controller. RoboFly flies freely, thanks to a photovoltaic cell on its body that converts energy from a narrow laser beam. It produces about 7 volts of electricity, which a flexible onboard circuit boosts to the 240 volts required for liftoff. Meanwhile, a microcontroller on the circuit acts as RoboFly's "brain," sending pulses of voltage to the wings and making them flap much like an insect's wings would, according to the statement.

However, the cell doesn't store energy; the circuit must be within range of the fixed laser to generate power for the robot to take off, and once its cell moves beyond the laser's reach, RoboFly's flight is over.
Tiny, highly maneuverable robots like RoboFly could quickly flutter into crevasses where bigger aerial drones simply wouldn't fit. One possible task for future versions of RoboFly could draw even more inspiration from flies — particularly, their talent for tracking down "smelly things," study co-author Sawyer Fuller, an assistant professor in the Department of Mechanical Engineering at the University of Washington, said in the statement.

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Former NASA Engineers Building Real-Life Underwater Transformer

In its ROV mode, Aquanaut has two arms for doing work.

Aquanaut will swim through the water in its sleek AUV mode.

Halpin said that Aquanaut's first fully-assembled underwater "tank test" should happen in the coming months, and that Houston Mechatronics expects to start marketing the robot to individual clients in 2019.

A transformer designed to do grunt work for the oil industry and military is coming, and it's... admittedly kind of fun to look at.

Houston Mechatronics, a small company founded and led by a team of former NASA robot engineers, announced May 1 some major strides toward building a transforming submersible the company calls "Aquanaut." The 2,315-pound (1,050 kilograms) unmanned underwater vehicle (UUV) will transform itself in order to operate in two modes, according to the company: a sleek, submarine-shaped autonomous underwater vehicle (AUV) mode, and an unfolded, two-armed remotely operated vehicle (ROV) mode for work.
"When Aquanaut moves through the water, we want as little drag as possible to extend the maximum range of what the vehicle can do on battery power," Houston Mechatronics spokesperson Sean Halpin said. "By enclosing the limbs, we're able to operate the vehicle over great distances, up to 200 kilometers [124 miles]." [24 Underwater Drones – The Boom in Robotics Beneath the Waves]

The underwater drone's two big selling points, Halpin told Live Science, are its long arms and long range. Each arm is a significant chunk of the Aquanaut's length — 9 feet 6 inches (2.9 meters) in AUV mode, and 11 feet 6 inches (3.5 meters) in ROV mode — and highly articulated for a number of tasks requiring dexterity. Halpin said that the arms are the only part that's been fully completed, but that they're the most difficult bit to design.

The first challenge of Aquanaut, he said, was "elegance." The company worked to come up with a design that was fully transformable and highly functional in ROV, mode while using as few moving parts as possible."As you can imagine, things that move may break," he said. "Now, if you see the Transformers in the Michael Bay movies they have a million little parts that are moving when they transform. That would not be how a normal robot would do it.“

The second challenge was intelligence, he said. Aquanaut, like all long-distance robot subs, has to function miles away from its home base, where the connection speed between it and its human controller might be just a "fraction of dial-up," so really weak, Halpin said.
That means that even as it obeys general instructions from its human controller, it has has to do a lot of its detailed decision-making on its own. Aquanaut is designed to inspect itself for damage and make fine motor adjustments under its own guidance.
Aquanaut is being funded primarily by the Defense Department and oil industry, according to Defense One.

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Hyundai Grandmaster Concept previews full-size SUV

At the 2018 Busan International Motor Show in South Korea Hyundai has presented the HDC-2 ‘Grandmaster’ SUV concept, evolving the “Sensuous Sportiness” design philosophy.

The HDC-2 ‘Grandmaster’ Concept anticipates the lines of a possible full-size SUV model, and further explores the ‘Sensuous Sportiness’ direction first introduced with the HDC-1 Le Fil Rouge Concept at the 2018 Geneva Motor Show.

“The Le Fil Rouge sedan provided a clear direction for Hyundai’s design philosophy, while the new SUV concept vehicle further proved the versatility of this design language that will be portrayed in future Hyundai vehicles, opening up new possibilities for an even wider spectrum of attractive designs.”

In addition, Hyundai also introduced the Veloster N at laying out the blueprint for its High Performance N Brand, which will feature a diversified product portfolio, which will include High Performance N models, N Line Vehicles with new design and performance enhancing elements and N Option, customization parts by N, which is available for the entire Hyundai line-up.

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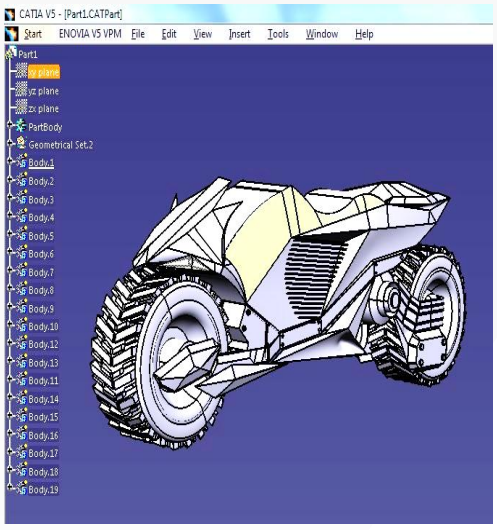
Student's Corner



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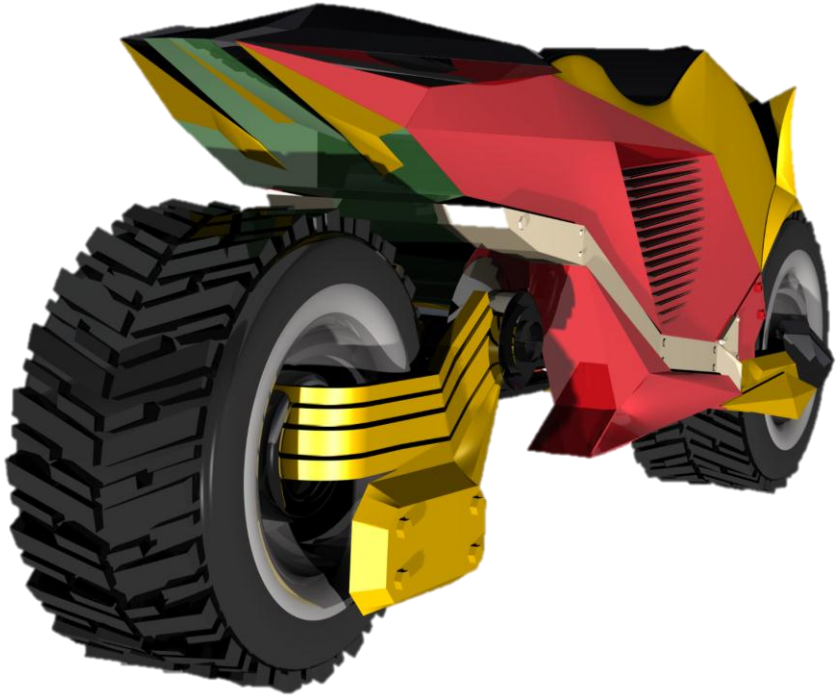

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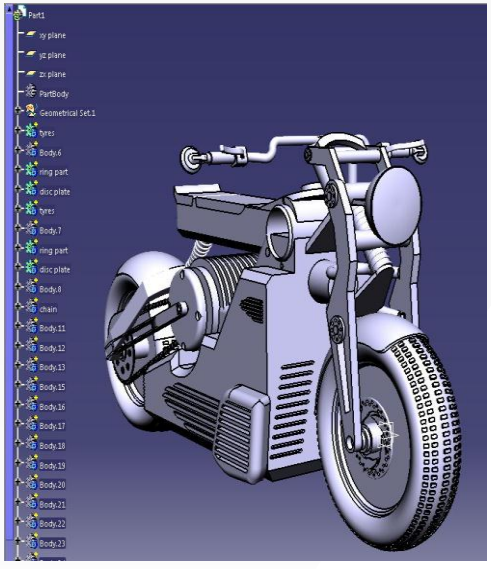
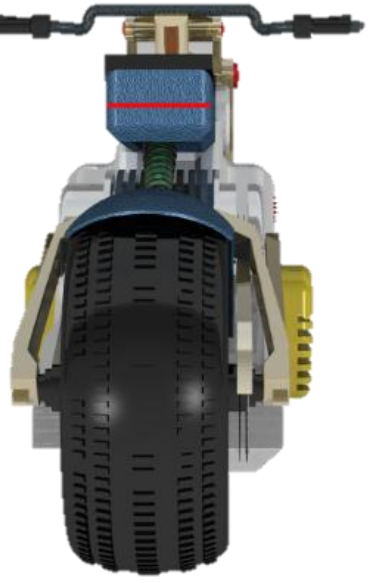
DAuto Training Yield





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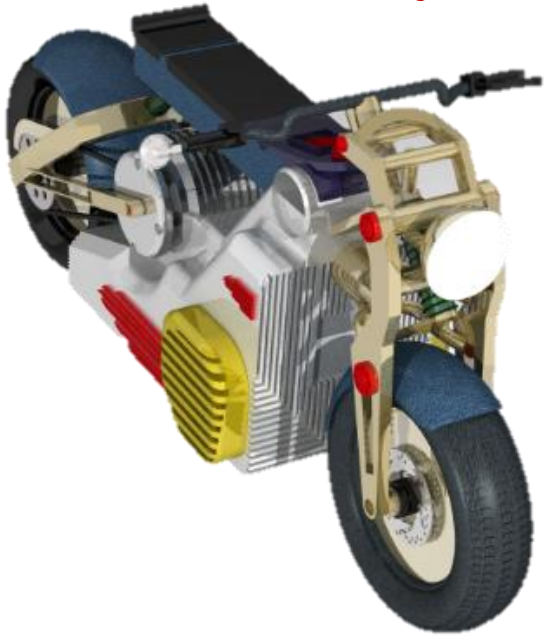

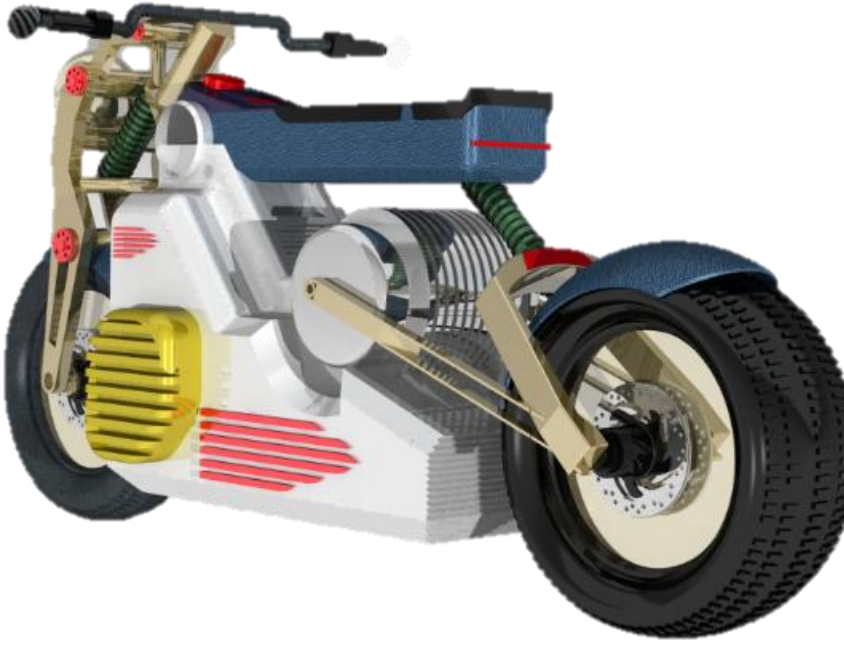

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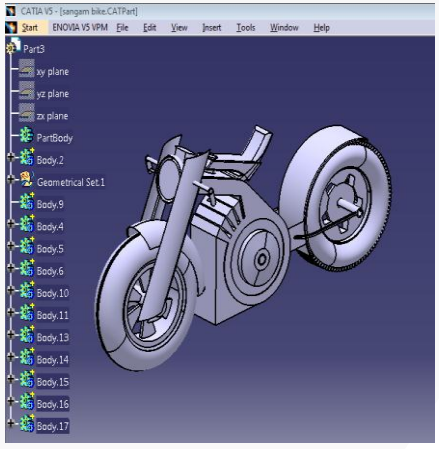

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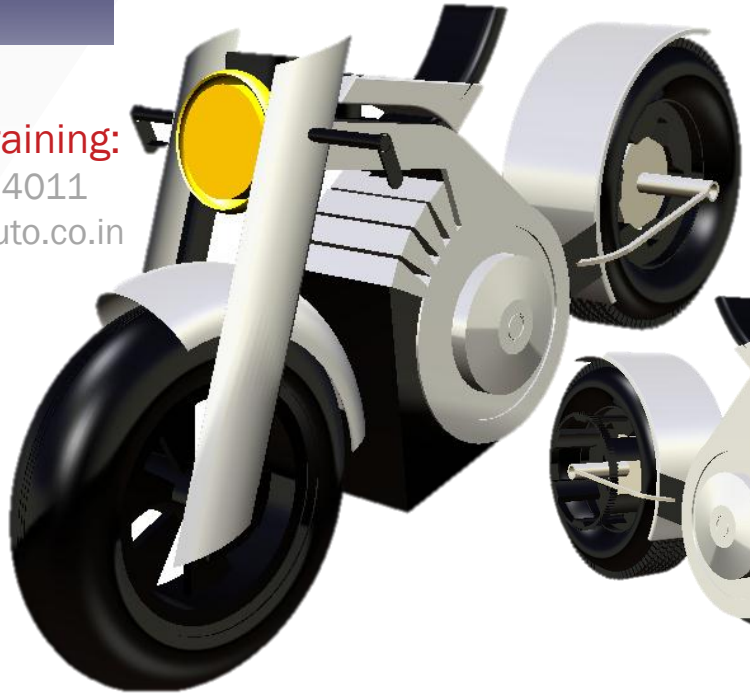

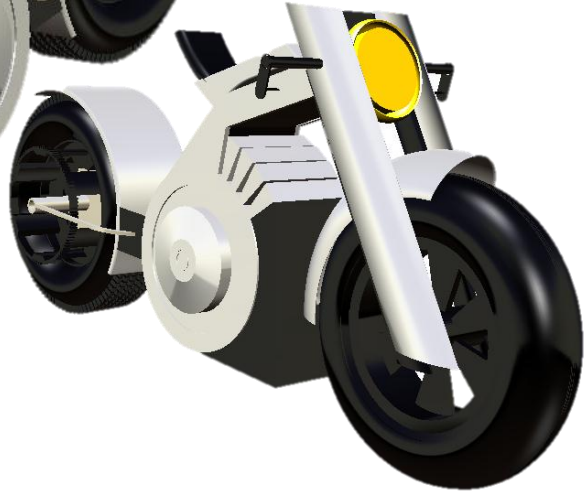

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“Never be satisfied with inaction. Question and redefine your purpose to attain progress”

Jeffrey K. Liker, The Toyota Way

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