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VAHANA KSHITHIJ

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Tesla Reveals the Secret Magic Behind their Autopilot System

The newest Tesla autonomous car doesn't just let people drive hands-free. It's intelligent, and capable of learning behavior's of both the operator and environment in order to make better driving decisions. While many high-end automakers are creating technology that allows cars to drive themselves, Tesla's technology is bound to leave them in the dust. Tesla's plan is to lower overall vehicle maintenance cost and lower collisions in conclusion lowering collision repair cost making it more affordable for the average American to own an electric vehicle.

The Tesla Cars Use Machine Learning

Tesla is utilizing a variety of high-tech systems, like mapping data, connectivity, and machine learning, to make their autopilot system cutting-edge. In a way, the technology that Tesla uses is an awful lot like what Google does. It's called machine learning, and it involves using an algorithm to analyze data, and then making accurate predictions based on the information. Google learns from user behavior, and generates more accurate results over time. For instance, a person who enjoys refinishing furniture, and routinely runs searches for woodworking materials and how-to articles, will likely get information on how to build or refinish furniture if he looks up "wood furniture." Another person might see listings for stores that sell wood furniture. Facebook does the same thing when it chooses what to put in your feed based on who you interact most with and which posts you like or comment. This is what the Tesla tech does, but on a much grander scale.

Tesla's autopilot system

Artificially Intelligent Car

Machine learning is a form of artificial intelligence, and many companies are harnessing the technology. However, Tesla's cars don't just learn from the experiences of one vehicle. They're all connected, and they will become smarter as more vehicles take to the streets. The autonomous Google car, which has been spoken about quite a lot, has been programmed to pause for a moment before leaving a red light. By doing so, it avoids collisions with those who try to slip into the intersection as the light is changing. While the Tesla car has a similar algorithm that detects common driving situations like this, it could learn other nuances of driving, like whether another driver is taking a curve too fast and is likely to drift.

-Sterine D'Silva

(1NH14AU013)

Inside this issue:

Deep Dive Rolls-Royce Phantom VIII

Rolls-Royce Phantom

Rolls-Royce knows today's buyer is different than before, and even something as precious as the Phantom has to evolve to stay relevant. The design team took the opportunity to leave the "humdrum of Good wood" and find a new vibe in London's trendy West End, hoping to discover a different perspective for the Phantom. The new sedan would need to be younger, have more charisma, and shed some of its stodgy "Brit stiff upper lip" attitude. It would need to be more avant-garde and more advanced, fit for the back streets of Beijing, the strip in Dubai, or London's fashionable Westbourne Grove.

The new Phantom's most modern, eye-catching feature is its "gallery," a hermetically sealed glass box that runs the length of the flat-faced dashboard and functions as a sort of display case. The car's gauge cluster is now digital, and the interior finally has four USB ports and an overdue wireless hot spot. There's more headroom in the still-epic back seats, and there's an extra 2.5 inches of various sound-deadening foam packed into the headliner. Auto-shutting doors close with a gentle nudge or the push of a button. Under the hood is a reworked version of the trademark 6.75-liter V-12, which now has two turbochargers and puts out 571 horsepower and 664 lb-ft of torque that builds from 1,800 rpm.

"We're not downsizing. Phantom is a statement," says product manager Christian Wettach. "You buy a Phantom because of the prestige, because of the status. So from that perspective it was clear to use a V-12. Same story for sticking with the traditional 6.75-liter displacement. An increase in performance came naturally because we're jumping from the naturally aspirated engine. So we didn't need to push ourselves too much to achieve a significant improvement [in power]."

"Everything should be made as simple as possible but not simple"
-Albert Einstein

It's lovely tinsel, but the unseen parts are what truly set this Phantom apart from its predecessors. The engineering team dedicated most of its resources to improving chassis dynamics and developing an all-new aluminum space frame, which will be the future platform for all Rolls-Royces, including the forthcoming Cullinan SUV. The Phantom's air springs are larger and have faster-reacting valves. There's now rear-wheel steering, and Rolls-Royce created an active roll-stabilization system that uses a big electric motor in place of typical anti-roll bars so the car can manipulate its rigidity and ride characteristics on the fly. "We're controlling 100 percent of how the car rolls. We could technically go around a bend without any roll, which would feel funny," Wettach says.

We're partial to purple. What's more pimpin' than a mulberry Roller?

More impressive still is the all-new, all-aluminum platform, which is far more sophisticated than the outgoing Phantom's "fairly simple" space-frame chassis. The seventh gen's platform paired two longitudinal bars with a couple standard crossbars and called it a day. Linked between the two longitudinal bars of the eighth-gen Phantom's platform, though, are a whole lot of little crisscrossing bars. They zig and zag to better handle directional forces, help to reduce weight while improving stiffness, and they all connect to large, cast-aluminum hubs called knots. "Some of the knots are really large and quite complicated, and none of our existing suppliers was capable of manufacturing those parts," Wettach says. "We had to go out and search, and we found one supplier, a small foundry in Italy that usually does engine blocks for supercars."

Rolls Royce

All of this creative and compelling work is done predominantly in places no one will see. We ask Wettach if he thinks Rolls-Royce's unwavering devotion to its heritage held back this Phantom in any way. He thinks, then looks up and says, "It's a fine balance between what you need to have to satisfy the current state-of-the-art requirements from the customers and how far you want to push yourself. You always try to hide the technology in the Phantom. It's somehow invisible."

Pockets of design ingenuity and engineering prowess still shine

through on this car, but overall it is a deliberate show of restraint from Rolls-Royce. It leaves us wondering what would happen if the automaker let go of bygones and focused instead on truly setting today's standard for automotive couture. Otherwise Rolls-Royce's deep roots and rich heritage might soon become a hindrance to its creative development, if they haven't already.

For now, though, this all-new Phantom seems to have the trimmings to be successful with both new and established Rolls-Royce buyers, and its architecture will provide a fantastic base upon which the brand can build and, hopefully, push forward.

"We had this idea that we would actually encapsulate and create space within which we can do all sorts of crazy things with materials, finishes, and commissioned art," says design director Giles Taylor.

The "gallery" will come standard on all Phantom models with the base gallery wrapped in a silver woven-silk cloth that uses metallic thread. "It's this little stage in the car. At night, with the backlight, it looks just beautiful," Taylor says. In the short term, owners will be able to swap out the silk wrap for wood, leather, or metal. A bit further down the line Rolls-Royce will work with owners and artists to commission and create unique installations.

Caption describing picture or graphic.

-**Sumukh P**
(1NH14AU052)

2018 Porsche Cayenne rides high on air suspension and a lighter unibody.

Porsche's pioneering Cayenne crossover SUV enters its third generation in 2018 following six-year runs of both the first- and second-generation models. In its latest iteration, new technology permits the Cayenne to get ever closer to reconciling the conflicting priorities of its Porsche sports-car heritage and its SUV off-road expectations.

The 2018 Cayenne is helped in its progress toward this by a lighter-yet-stronger uni body structure made with both aluminum and various grades of steel; it is Porsche's interpretation of the Volkswagen Group's MLB Evo platform, which debuted in 100 mm-longer form as the Audi Q7.

The MLB Evo architecture replaces the previous Cayenne's rubber bushing-mounted steel front sub frame with a new bearing-mounted aluminum sub frame that is lighter and contributes to improved steering response.

Much of the body-in-white is aluminum, including the roof, floor pan, front section, doors, fenders, hood and hatch. This is strategically reinforced by micro-alloyed high-strength steel and multi-phase steel to produce a body that is 20% more rigid than that of the outgoing model while trimming 298 lb (135 kg) from the body shell.

Some of the hard-won weight savings was lost due to the increase in standard equipment that reduced the final curb-weight reduction, reported a dismayed-sounding Karl Heess (pronounced "Hayes"), chassis director for the SUV product line.

The 2,020-kg curb weight of the Cayenne S, for example, is 143 lb (65 kg) less that the previous model. Because of differences in standard equipment, the 4,376-lb. (1,985-kg) base Cayenne saves 121 lb (55 kg), while there is a paltry 22 lb (10 kg) reduction for the 4,795-lb (2,175-kg) Cayenne Turbo. Ten kg of every model's savings is attributable to the substitution of a lightweight lithium-ion battery in place of the lead-acid battery used previously.

Much of the Turbo's extra weight can be attributed to its gargantuan brakes. They are 16.34-in (415-mm) cast-iron front rotors squeezed by suitably enormous Akebono 10-piston monobloc aluminum front calipers and 14.37-in (365-mm) cast-iron rear rotors with Brembo four-piston monobloc aluminum calipers. The oversized brakes are a necessity

"It doesn't matter where you come from. All that matters is where you are going."
-Brian Tracy

Porsche Cayenne

Porsche Cayenne

for such a heavy vehicle propelled by a 550-hp, twin-turbocharged 4.0-L V8 engine capable of producing 3.9-sec 0-60 mph (0-97 km/h) acceleration and a top speed of 178 mph .

The base Cayenne uses 13.8-in (350-mm) front brakes with four-piston mono-bloc aluminum calipers and 13-in (330-mm) rear rotors with two-piston aluminum mono-bloc calipers, while the Cayenne S employs larger 15.35-in (390-mm) front rotors with six-piston aluminum monobloc calipers and 13-in rear rotors with four-piston aluminum monobloc calipers. All of these components are Brembo-supplied.

All of the Cayenne's cast-iron rotors have a tungsten-carbide coating, which both boosts rotor life by 30 percent and reduces the amount of wheel-dirtying brake dust produced.

All-turbo engines

Twenty-one-inch wheels are standard on the Turbo to provide necessary space for the huge brakes, while 19-inch wheels are standard on the base and S models, with 21-inch wheels available optionally.

The base engine is a 340-hp single-turbo 3.0-L V6, while the S enjoys 440 hp from a 2.9-L twin-turbo V6. Both engines are from the same family, but the larger one has a 3-mm-longer stroke. A plug-in hybrid-electric and a diesel will follow, but the company declined to provide details on those versions.

All three gasoline-powered models use an 8-speed ZF Tiptronic S planetary automatic transmission with an added "hang-on" power take-off to drive the front wheels.

-Jeo Philip G

(1NH14AU023)

"How people treat you is their karma, how you react is yours"

-Wayne Dyer.

2018 Stinger: Kia's track-capable family hauler

Hyundai's Kia brand has done an excellent job of expanding its product portfolio in recent years, especially in styling and quality. But has anyone looked to Kia for world-class performance? Probably not, because that cupboard has been bare. Until now.

Kia calls its 2018 Stinger a "five-passenger sportback poised to redefine a segment currently populated by European automakers" and compares twin-turbo V-6 GT models to similar-size 6-cylinder performance cars from the likes of Audi(S5, A7), BMW (4-Series, 6-Series), Infiniti (Q50), Lexus GS350, Mercedes-Benz CLS and even Porsche (Panamera). The Stinger beats all of those on power, torque and top speed and (at 4.7 s) all but the Audi S5 in 0-60 mph acceleration.

At the same time, it exceeds all but the Audi A7 Sportback and Panamara on total interior volume and (at 23.3 ft^3) all but the Audi Sportback on cargo volume behind the rear seats. And (at $31,900USD for the base RWD turbo-4-cyl. and $38,350USD for the RWD GT) it handily undercuts the lot of them on price.

Stinger is Kia's second rear-wheel-drive product (after the K900 luxury sedan) and its first to offer all-wheel drive. It shares the basic architecture of Hyundai's G70 four-door sedan. "The first decision was to make it all-wheel-drive," says Chahe Apelian, Senior Manager, Vehicle Evaluation, Test and Development, "because inclement weather requires that for high performance. And from a dynamic standpoint, starting from a clean sheet of paper, it made sense to go with traditional rear drive and an all-wheel-drive option."

2018 Stinger

A new 55% advanced high-strength steel chassis provides an ultra-stiff foundation for its MacPherson front (with large-diameter shocks, high-strength wheel bearings and an aluminum strut brace) and reinforced five-link rear suspension. GT models boast Dynamic Stability Damping Control, Kia's first continuously damping electronically controlled suspension, with driver-selectable Eco, Sport, Comfort, Smart and Custom modes. Rack-mounted Motor Driven Power Steering (R-MDPS) is standard, with variable-ratio capability on GTs.

The available AWD features a new Dynamic Torque Vectoring Control system that automatically applies power and/or braking to the appropriate wheels as needed. Up to 50% of engine torque can be distributed to the front wheels, or (in Sport mode)

up to 80% to the rear, and it also distributes power side to side. Rear-drive GT2 models offer a multi-plate limited-slip differential to enhance directional stability by evenly distributing power to the rear wheels.

The 2.0L twin-scroll-turbocharged Hyundai Theta II 4-cylinder generates a claimed 255 hp (190 kW) at 6200 rpm and 260 lb·ft (352 N·m) from 1400-4000 rpm—good for 5.9-s acceleration from 0-60 mph). GT models' 3.3-L twin-turbo V6 Lambda II engine offers 365 hp (272 kW) at 6000 rpm and 376 lb·ft (509 N·m) from 1350-4500 rpm. Both drive through Hyundai's 8-speed planetary automatic with a Centrifugal Pendulum Absorber (CPA) torque converter on the 4-cylinder to help reduce torsional vibrations.

High-performance fade-compensating Brembo disc brakes with quad-piston front and dual-piston rear calipers are standard on GT models.

Dynamics development in Korea, the U.S. and elsewhere, including many hard-driving miles on Germany's grueling Nürburgring race track, was overseen by Kia Test and High Performance Development head Albert Biermann. "That is part of our global development process," Apelian explains. "That is a very challenging and demanding circuit that pushes not just the dynamics engineers but also the structural engineers quite a bit.

"You go through the whole motions of the suspension, all kinds of G loading, acceleration and braking," he continued. "It is a good tool for vehicle dynamics, like Death Valley is a good tool for high temperatures. We do quite a bit of basic development there for dynamics, then do refinement globally."

-Arjuna S
(1NH15AU400)

KIA'S 2018 Stinger

Toyotas concept of connecting all its American made cars

All U.S.-market Toyota models will be enabled with cellular/internet connectivity by 2020, said Zach Hicks, CEO and president of Toyota Connected and senior VP and CIO of Toyota Motor North America, reaffirmed during a media briefing at the 2018 Consumer Electronics Show (CES) in Las Vegas this week.

All of Toyota's Lexus premium-brand models already featured connectivity functionality (via a data communications module, or DCM), Hicks said, adding that it "may take until 2020" for all Toyota-brand models to have connectivity hardware, but the company is "committed to having all Toyota's connected.

Toyota is being more cautious about introducing over-the-air (OTA) updating capability for onboard-system software, however. Both Hicks and Gil Pratt, CEO of the Toyota Research Institute, said that concerns about cybersecurity mean the company will be moving carefully on OTA, which introduces a new threat channel into the vehicle. They did say, however, that OTA does offer obvious advantages in terms of delivering quick and efficient software updates and upgrades to a large number of vehicles already in customers' hands.

Toyota also announced at CES that it will this year begin introduction of Alexa, Amazon's cloud-based voice service, within select Toyota and Lexus vehicles fitted with the Toyota Entune 3.0 App Suite and Lexus Enform App Suite 2.0—with additional models to feature Alexa connectivity in 2019. The company said in a release that Alexa integration "will allow Toyota and Lexus customers in the United States to interact with Alexa in the car."

"Voice services are rapidly becoming more popular and through our integration with Amazon Alexa, Toyota and Lexus customers will soon be able to easily speak to Alexa in their cars while on-the-go," said Hicks. Toyota envisions the Alexa capability to allow customers to engage tasks such as interacting with smart-home features while traveling or use the voice control to obtain directions to a destination.

-Aldwin Rajan
(1NH14AU003)

"Don't count the days. Make the days count."
-Muhammed Ali

Toyota's concept of connectivity

Plug-in hybrid brings Honda into sharper Clarity

Honda's Plug in hybrid

Honda's recently introduced Clarity plug-in hybrid sedan is the third variant of this revitalized and electrified nameplate. It joins the Clarity Fuel Cell, which debuted in December 2016 and the Clarity Battery Electric that arrived in the U.S. market in August 2017. The Plug-in Hybrid is the only one that's available in all 50 states and the sole version customers can purchase.

The base Plug-in is $33,400 with a more upscale Touring model offering features like leather seats and satellite navigation ringing in at $36,600. Available by lease only, the Fuel Cell is just for California consumption and the Battery Electric version is currently offered only in a couple U.S. West Coast states at present. Honda will also offer the Plug-in in Canada.

The latest Clarity is currently the only passenger car that's available with a choice of these three propulsion systems. Its overtly aerodynamic form may conjure up a sort of modern Tatra or Citroen, but the skirted wheelhouses (think 2000 Insight), scoops, air curtains, tall tail and full-figured shape are the result of careful CFD analysis and wind-tunnel work. While Honda engineers at the car's U.S. media launch would not reveal a coefficient-of-drag number, the full underbody pan and wind-cheating shape would seem to indicate the Clarity Cd resides somewhere in the low 0.2x range.

Packaging and light weighting

Work on the second-generation Clarity began in March, 2013. The car appears a tad 'bloated' because it has to accommodate a wide range of componentry. The "engine" compartment had to be large enough to fit a power control unit, the 181-hp (135 -kW) four-stage synchronous electric motor and related hardware, the plug-in version's 103

"The roots of education are bitter but the fruit is sweet."

-Aristotle

-hp (77-kW) 1.5-L, LEV3 SULV20-certified Atkinson cycle 4-cylinder engine or the fuel-cell model's stack. Compared to the previous generation FCV Clarity, Honda succeeded in developing a more power-dense fuel-cell stack for the new car that is 33% more compact.

The cabin had to be tall enough to package a large-capacity lithium-ion battery (25.5 kW·h for the electric, 17.0 kW·h for the plug-in hybrid) under the passenger floor. In the case of the fuel cell version, a small 1.7-kW·h lithium-ion "buffer" battery under the front passenger seat and a 6-gal (22-L) composite-reinforced/aluminum-lined, cylindrical hydrogen tank beneath the rear chairs.

Finally, the cargo bay needed to be roomy enough to house the fuel-cell's bigger 31-gal (117-L) H2 tank or the second part of the full-electric's 25.5 kW·h battery and the electric charger, while not unduly impinging on luggage space (an impressive 15.5 ft3 in the Plug-in) and enabling trunk pass-through and fold-down rear seats on the Plug -in version to handle longer objects.

With new Clarity's larger footprint came added mass. To combat the weight gain, the company employed premium materials in key areas. Honda says that more than 40% of the Clarity's structure utilizes super high-tensile steel. To be specific, there's 1500 MPa material in the front door apertures and some roof sections and 980 MPa alloy in sections of the cabin floor, front load-path rails, rear bulkhead and roof cross members.

The hood, door outers, decklid, front fenders and front bumper beam are constructed of alumin-

Honda'

ium, and the front bulkhead is a resin-hybrid structure. Clarity's rear bumper beam is a GFRP hybrid molding, the world's first application says Honda. There's more use of aluminium in the Clarity's lightweight chassis, including a front strut and rear multilink suspension with forged aluminium control arms, cast-AL tie-rods, an AL sub frame and a hollow die-cast front sub frame.

To meet or exceed U.S. crash standards going forward, the Clarity employs a new 'straight' body frame structure to handle small-overlap front impacts, side impacts and rear impacts. The door B-pillars connect to a roof cross member; this is why the Clarity does not offer a sunroof.

-Deepak (1NH14AU012)

Solving the 'grand challenge' of battery research

Jaguar's electric I-PACE SUV concept is fast becoming a production reality. It uses a 90 -kW·h lithium-ion battery pack. (Jaguar)

Research universities are playing an increasingly vital role in advanced automotive battery R&D and manufacturing capability. Among several new partnerships in Europe is the British government's investment in the multi-faceted Faraday Battery Challenge, which provides links between leading universities and the auto industry.

Helping to meet that Challenge is the recently announced Faraday Battery Institution, created to coordinate U.K. academic research in partnership with industry. The Institution brings together seven U.K. universities to accelerate fundamental research in the development of battery technologies, including the University of Warwick, Imperial College, London; University College London; University of Cambridge; University of Oxford; Newcastle University; and the University of Southampton.

Prof. David Greenwood, Professor of Advanced Propulsion Systems at the University of Warwick's Manufacturing Group, recently spoke with SAE's European Editor Stuart Birch about the new organization.

The Institution is set to explore "novel approaches" to battery development; what are these likely to be and which would be the salient areas?

The central principle of the Faraday Institution is 'application-inspired fundamental research'. This means the right science and technology experts working together on the future advances that are going to drive innovation towards commercial application.

Jaguar's electric I-PACE SUV

The initial focus for this investment is the automotive industry, which has an urgent need for low carbon solutions, but other sectors, such as grid, marine, and aerospace, are likely to grow.

The Faraday Institution will work on research programs developed from grand challenges set by industry, so a focus will be on the biggest research issues that are inhibiting progress. The first tranche of research areas covered will be battery degradation, multi-scale modelling, solid state batteries and recycling / circular economy.

An important approach is that these programs will be managed to ensure that investment remains targeted at the areas that show promise for accelerated development. The Institution will intentionally have a broad scope which does not just focus on electrochemistry and materials. These are important, but we need to think about the wider systems and broader engineering, manufacturing and integration which will also have a significant impact on technology development. This means bringing together different disciplines to work on these challenges collaboratively, whether that's chemists, engineers, mathematicians, economists or physicists.

From a public perspective, lack of energy density, high cost, excessive weight and recharge time, remain the negative aspects of electric vehicle use; are you confident that these can all be successfully and satisfactorily addressed?

We are continually seeing rapid improvements in lithium-ion battery technologies which are used in electric vehicles today. For example, volumetric energy density has doubled in the last 15 years, and costs have fallen by a factor of four within the last 5-10 years. We are seeing these improvements as a result of technology optimization.

"Let your hopes and not your hurts shape your future."
-Robert H

Researchers are demonstrating that continued improvements are feasible, both through continued optimization of current systems, development of new chemistries, and whole systems design and integration.

The challenge is that new technologies, which are emerging at a 'proof-of-concept' stage, will take at least eight to ten years to make it to the commercial market as fully validated, industrially manufactured products.

The chemistries we are using in electric vehicles today were developed in labs in previous decades. Commercial batteries are the result of a long-term development process to optimize and validate them for industrial scale manufacturing for specific applications.

Fundamental battery innovation is only the first part of the journey. It needs to be followed up by further development to overcome the complex challenges of manufacture for applications which require high standards of quality, robustness, safety and performance.

Jaguar's electric I-PACE SUV

Artificial intelligence becomes a reality

Artificial intelligence

The soaring role of software has already fostered many changes for automakers, but those transitions may pale in comparison to the challenges expected when artificial intelligence is employed in the race to autonomous driving. Machine learning cedes even more control to software, raising myriad design and testing issues—while also provoking legal and ethical questions.

Automakers and Tier 1s alike are embracing AI's potential, saying it's needed to analyze the myriad elements that self-driving cars must understand. Ford invested $1 billion in start up Argo AI. Toyota Research Institute will devote $1 billion to AI development over five years.

When the Bosch Center for Artificial Intelligence was created, executives said "ten years from now, scarcely any Bosch product will be conceivable without artificial intelligence." These investments are needed because programmers can't write the software code that will be needed for vehicles that navigate without human control.

"Most current advanced driver-assistance systems based on radar and cameras are not capable of accurately detecting and classifying objects – such as cars, pedestrians or bicycles – at a level required for autonomous driving," said Visteon President and CEO Sachin Lawande. "We need to achieve virtually 100% accuracy for autonomous driving, which will require innovative solutions based on deep machine-learning technology."

Although AI's been heavily touted, deploying it won't be easy. The technical issues are many— and its role in shaping autonomous-driving principles also means social and regulatory issues will be key factors in its acceptance.

Critics question whether anyone will be able to find all the potential bugs in AI-reliant software to make it live up to the hype of accident-free roadways. Developers note that AI can reduce accidents and related injuries. But it will be hard to quantify those improvements.

"It's the truth that liberates, not your effort to be free" -Jiddu Krishnamurthy.

"We can't promise that self-driving cars won't cause accidents," said Martin Richter, Vice President, Vehicle Systems at IAV Automotive Engineering. "But we can make sure that these vehicles will kill fewer people than human drivers. Companies will need to keep statistics, looking at the number of accidents to determine if they're developing good systems. Companies will have to prove that in so many miles, vehicles had this number of accidents. Companies and regulators will have to define acceptable levels for accidents."

The difficulty of defining performance levels for software that changes its responses over time is augmented by the need for cloud computing and over-the-air (OTA) updates. As vehicles learn, strategists also have to figure out how to share the learning throughout fleets. Many observers feel that individual vehicles shouldn't be allowed to alter their behavior without some form of authorization.

"When it comes to safety-relevant features, vehicles should not be allowed to learn by themselves," said Demetrio Aiello, Head of Artificial Intelligence and Robotics at Continental. "Rather, each vehicle should forward its experiences to a back-end system for collection. These data can then be used to generate—and validate—new and more performant algorithms that can be distributed to all the vehicles via OTA updates. Therefore, during the vehicle lifetime safety can only be increased and not compromised."

Artificial intelligence

Cloudy future

Remote computing will be a critical aspect of any AI-based system, following the trend in commercial environments to process AI using cloud computing. A growing number of automakers are setting the stage by using the cloud for complex tasks like voice recognition.

The combination of autonomy and cloud computing makes security a primary design concern. AI may go beyond its role in driving decisions and help in the battle to prevent hackers from tapping into cloud connections and to control autonomous cars or steal information.

"Connectivity will enable developers to continuously upgrade software and also to monitor the performance of automotive systems," said Upton Bowden, director, advanced technology planning at Visteon Corp. "Clearly, the connection also brings about the requirement for internet security protocols to make these connected vehicles 'hack proof.' Artificial intelligence will also play a role in detecting malicious hacks and in training vehicles on how to block threats."

Volvo's Polestar unveils 600-hp performance hybrid

Polestar, Volvo Car Group's performance brand, unveiled its first car, the 600-hp (448-kW) Polestar 1 performance hybrid. Available in mid-2019, it is the first of three vehicles from Polestar as part of the company's new standalone electric performance brand. It will be assembled in China at Polestar's purpose-built production facility in Chengdu.

The Polestar 1 is a two-door, 2+2 seat Grand Tourer Coupé with an electric performance hybrid drivetrain. An electric car supported by an internal combustion engine, it has a range of 150 kms on pure electric power alone—the longest full electric range of any hybrid car on the market says Polestar. Its output of 600 hp and 1000 Nm (738 lb·ft) of torque places the car firmly in the performance car segment.

"Polestar 1 is the first car to carry the Polestar on the bonnet," said Thomas Ingenlath, Chief Executive Officer of Polestar, in a release statement. "A beautiful GT with cutting edge technology—a great start for our new Polestar brand. All future cars from Polestar will feature a fully electric drivetrain, delivering on our brand vision of being the new standalone electric performance brand."

The performance hybrid is based on Volvo's Scalable Platform Architecture (SPA), but approximately 50% is new and bespoke, created by Polestar's engineers. To reinforce its dynamic driving characteristics, Polestar 1 benefits from several new technologies, all aimed at making it a true driver's car.

According to the company, Polestar 1 is the world's first car to be fitted with the all-new Öhlins Continuously Controlled Electronic Suspension (CESi) advanced chassis technology. The Polestar 1's carbon fiber body reduces body weight and improves torsional stiffness by 45%, as well as lowers the car's center of gravity. Additionally, Polestar 1 uses a double-electric rear axle that enables torque vectoring. This supports the driver with precise acceleration on each wheel to keep the maximum road grip and maintain speed while cornering. It also features Akebono six piston brakes.

Volvo's Polestar

All future cars from Polestar will have a fully electric powertrain, according to a release from the company.

Polestar 2 will start production later in 2019 and will be the first battery-electric vehicle (BEV) from the Volvo Car Group. It will be a mid-sized BEV, joining the competition around the Tesla Model 3, and with consequently higher volumes than Polestar 1. The initial phase of the Polestar product roll out will then be completed by the subsequent arrival of a larger SUV-style BEV, the Polestar 3.

The cars will be ordered exclusively online and offered on a two- or three-year subscription basis, Polestar reports. The zero-deposit, all-inclusive subscription will also add features such as pick-up and delivery servicing and the ability to rent alternative vehicles within the Volvo and Polestar range, all incorporated into one monthly payment.

-Bharath Rai

(1NH14AU008)

"Let no man pull you low enough to hate him."

-Martin Luther King.

INSPIRING STORY OF FORD

Ford Motor Company was founded by the late Henry Ford in 1903. A century after, the company withstood wars, depression and competition. It is the fifth largest company to date based on worldwide car sales. But just like most businesses, Ford started small. The company had to overcome a lot of struggles and pass several stages and changes in its history.

Henry Ford left home at an early age and worked as an apprentice in some automotive companies until he decided to have one of his own. He founded the Detroit Automobile Company in 1899 and renamed as the Henry Ford Company in 1901. As cases with most starters, he encountered financial difficulties and had to leave the company. Leaving the company paved the way to his success. As Ford once said, "***Failure is simply the opportunity to begin again, this time more intelligently.***" Living with this

principle, he tried again and founded what we now know as Ford Motor Company. He also introduced the then unheard of 'assembly line' for his car manufacturing and changed the game for the car industry.

Cars at that time were limited to people of wealth. Though transportation was a daily cadence by people from all walks of life, it was considered an expensive toy for the rich. Car production was still in its infanthood, and production costs were sky high. Thus, owning a car was exclusive for the rich. Until Ford's assembly line.

Henry Ford founded Ford Motor Company with the vision of making quality cars generally available and affordable for the majority. This American dream was not as easy as it sounded. The company started producing automobiles the traditional way, but with the time it was taking to finish a unit along with the materials needed, they had no choice but to compensate these expenses towards the price of their cars. Each automobile needed roughly 12 hours to complete which was costing the company labor and time.

So, Ford started another approach on making cars. He identified stages or steps to creating a unit. Then, he disseminated his workers to specialize on a certain stage. And using a machine similar to a conveyor belt, the cars were moved from one stage to another until all parts were placed. This method significantly decreased labor from the traditional 12-hour period down to 2 hours and 30 minutes. The system decreased the costs and so the car price. Model T, their most popular car unit, had its price reduced from $850 to $290.But, contrary to the positive reaction of the consumers, other car companies' sales plummeted to rock bottom.

When Ford implemented the new system, the entire car industry was indignant at Ford for changing the eco-system of the industry. When the Great Depression struck America, 183 out of 200 automobile companies declared bankruptcy. Other car companies knew they had to do something to survive. GM went to the route of creating more personalized cars, Chrysler and Chevrolet started manufacturing automobiles with more creative features while others looked for better ways of assembling cars. Ford survived the Depression.

Early on, the game-changer is always looked upon as a dissident, an annoying disturbance, a newbie about to fail. It is later, when the system is adapted and accepted, that many will recognize it as an innovation and a legacy, and the game-changer a brilliant trendsetter and leader.

Ford Motor Company is history itself. It has experienced successes and failures, but through the collective effort of all the people behind it, the company has survived even the greatest war. Along with it, they've learned to be innovative, versatile and adaptable to the changes of the world. These have made Ford the mighty company we now see 103 years after it was founded in 1903.

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