Telematics Wire

Technology Driven | Futuristic Vehicle

Driver recognized
Hi, I'm adjusting the vehicle
to your preferences

Retrieving user
profile/preferences

Traffic ahead
Taking your favorite
scenic route, instead

Configuring displays for
driver and passengers

Changing from sport
to comfort mode

2:34 74°F May 9

Driver falling asleep
Playing your rock music

Body temperature is low
I'll turn down the AC

Playing your kids'
favorite cartoon

5G

Photo Credit: Strategy Analytics

BLOCK YOUR DATES

INDIA @ 75
a CII initiative

75
Azadi Ka
Amrit Mahotsav

CII
Confederation of Indian Industry

10th Edition
AUTO SERVE®
2022

India's Go to Event for Automotive Aftermarket

📅 **11 - 13 November 2022**
Chennai Trade Centre, Chennai

An Exhibition & Conference on Automotive Care, Maintenance, Service, Parts, Garage Equipments and Accessories

— Fact Sheet —

- **120+ Exhibitors**
- **International Conference on Automotive Aftermarket**
- **Workshop / Seminar in Vernacular Languages**
- **Networking & B2B Meetings**
- **300+ Conference Delegates & 12,000+ Business Visitors**
- **Live Product Launches & Presentations**

Confederation of Indian Industry has been organising Autoserve - India's Largest & Focused Exhibition on Automotive Care, Maintenance, Service, Parts & Garage Equipment with an objective to bring more awareness on the latest trends & technologies and to offer a platform for sourcing & networking for the Indian Automotive Aftermarket segments.

The 10th edition of **Autoserve 2022** is scheduled from **11 – 13 November 2022** at **Chennai Trade Centre, Chennai**, India. The Exhibition and Conference will focus on the latest trends, innovations, start-ups, skill development, R&D, equipment & technologies in the Automotive Aftermarket Sector and would provide a platform to various stakeholders to learn the best practices and deliberate on the opportunities to build a strong growth trajectory for the Automotive Aftermarket Industry.

As part of Autoserve, An International Conference on Automotive Aftermarket will be organised on **11 November 2022**. The Conference would cover the following sessions;

Session 1: Changing dynamics & How digitalization Drives Change in the Automotive Aftermarket Industry?
Session 2: Automotive Aftermarket Garages in India: Now, Near future, and Ever After
Session 3: Indian Aftermarket Tyre Market - Industry Dynamics, Technologies, Trends & Opportunities
Session 4: Panel Discussion on Genuine Spare parts Vs Counterfeit Parts in Aftermarket & How to Tackle It.

▶ **For any further details, sponsorship / stall booking, please contact M : +91 99402 34408 | E : kazhal.vendhan@cii.in**

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XA Group to provide automotive estimatics for India

GT Motive, a provider of repair data and solutions based in Spain, has signed an agreement with XA Group. This partnership will enable XA Group to offer dealers and repairers in India with a technology for repair cost calculations, based on Original Equipment Manufacturer (OEM) data developed by GT Motive. GT Motive will provide repair data and the GT Estimate software solution to be integrated by XA Group as part of the latter's aftersales services offering to dealers and repairers in India.

GT Estimate is repair software that assesses vehicle damage and reports on reparability issues and vehicle condition. Fully cloud-based solution for calculating the cost of the repairs to be made to a vehicle following a collision, mechanical breakdown and/or inspection services.

GT EstimateTM provides all of the mechanical and bodywork information on parts, labour and paint needed by automotive professional.

Benefits
- User friendly: build with a responsive web-design so you can use on any device, anywhere, anytime.
- Always updated: fully cloud-based solution that is always up to date. No installation needed.
- Connected: integrated with the leading DMS, management systems, and workflow platforms like GT GlobalTM
- Accurate: identification of the exact model and equipment via license plate lookup and GT VIN QueryTM.

Features
- Coverage for collision, glass and maintenance data across 38 manufacturers and 1,500 models.
- Database built around OEM parts and labor information, with manufacturer, AZT, Cevismap and Centro Zaragoza paint systems.
- Web-services: optimized flexibility by leveraging our web-services to easily integrate our database and product capabilities into our customers workflows and tools.
- License plate query: identification of the vehicle chassis number by entering the number plate (optional).
- GT VIN QueryTM: identification of the vehicle's equipment through the VIN or chassis number (optional).
- Business Rules: control and optimize the performance of your network of collaborators with highly configurable business rules (optional).

Headquartered in Madrid and present in 28 countries, GT Motive specializes in delivering automotive data to the repair, insurance, fleet and leasing industries. The company envisages a more open and collaborative ecosystem, providing data access to enable claims and repair digitalisation. Utilizing the latest technologies, GT Motive processes more than 5 million vehicle estimates every year.

Operating across the Middle East, South Asia and Europe, XA Group provides Digital, Hardware, and Manpower solutions in the automotive aftersales industry. The company thrives on providing customers with an array of next-generation capabilities, disruptive technologies and partner offerings that work in synergy to reshape the industry landscape.
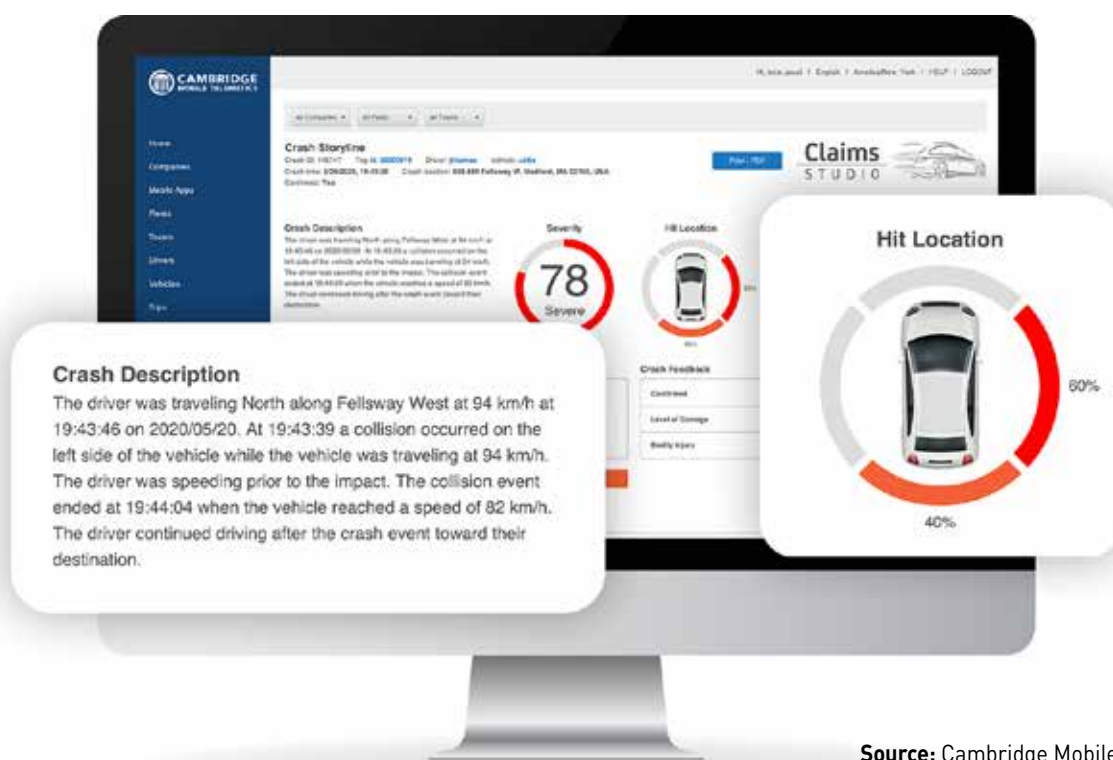
Source: Cambridge Mobile Telematics

DriveWell Crash & Claims for auto insurers

Cambridge Mobile Telematics (CMT) has launched DriveWell Crash & Claims, a new version of its DriveWell telematics platform that enables "proactive claims" by providing auto insurers with information about crash moments after it's detected.

The new solution includes total loss, injury, and fraud detection capabilities, in addition to the real-time crash detection and assistance that were already incorporated in CMT's DriveWell Auto.

Total loss indicator: By analyzing the telematics data available at the time of a crash, along with other accident and vehicle details, CMT can identify when a vehicle is a total loss. Determining when a vehicle is a total loss at or near the time of crash will save auto insurers hundreds of dollars per claim and help them get customers back on the road faster.

Injury detection: DriveWell Crash & Claims identifies crashes with potential injuries. Injury detection helps insurers channel the right claim to the right adjuster sooner, ensuring more experienced adjusters handle more complex claims and reduce legal costs.

Fraud identification: DriveWell Crash & Claims helps insurers identify fraud faster. With telematics data like date, time, location, driving patterns, and other data points, insurers can better identify fraudulent claims.

CMT said that, since it first began detecting car crashes with mobile telematics in 2016, 18 organizations worldwide have adopted the company's crash and claims products and solutions with more than 2.1 million drivers enrolled.

CMT's DriveWell platform is used by such major auto insurers as State Farm, Liberty Mutual, and Nationwide, as well as regional carriers like Plymouth Rock, Mercury, and Erie, and insuretechs like Marmalade. The company is the world's largest telematics provider, working with 21 of the 25 largest U.S. auto insurers.

Drivewell Crash & Claims promises an automated, touchless claims process for total losses. Through data analysis, the platform can identify crashes with potential injuries, helping carriers "channel the right claim to the right adjuster sooner," CMT said. It said insurers would see reduced legal costs by ensuring that more complex claims went to more experienced adjusters.

DriveWell Crash & Claims can also help insurers identify fraud more quickly and more accurately, CMT said, through the use of such telematics data as date, time, location, driving patterns, and other data points.

Prior to the launch of Crash & Claims, automatic crash detection and digital first notice of loss (FNOL) were already available through the DriveWell platform on internet of things (IoT) devices like smartphones and tags.

CMT expanded its AI-driven telematics program DriveWell to connected vehicles in April. The expansion, which is an opt-in for customers, will give participating insurers access to connected vehicle data from over 20 automakers in the United States, Canada, and Europe.

The company said the expansion could help auto insurers accelerate their adoption of connected vehicle data, which it called "still in its early stages."

CMT said that by using its DriveWell platform to detect car crashes from sensor data, auto insurers can "proactively help customers with emergency and tow services within seconds of a crash." It suggested that carriers could use this information to use "in-network providers, reducing the cost of each claim."

Source: Cerence

Cerence Link, a vehicle telematics device, now available in India

Cerence Inc. introduced Cerence Link, a new solution that delivers the power of connectivity and AI to both new cars and cars currently on the road. With Cerence Connected Vehicle Digital Twin (CVDT) as its foundation, Cerence Link brings Cerence's AI-powered technologies together with cloud-based intelligence to enhance drivers' safety, security, comfort, and convenience. Cerence Link has been adopted by a large, multinational automaker and has begun shipping in India.

Of all passenger cars produced globally, in recent years only half have built-in connectivity. This means that approximately 40 million cars are produced that are not connected and therefore not equipped with the latest safety, security and comfort-enhancing innovations. An additional 600 million cars on the road today do not have any level of connectivity.

Cerence Link is a software and hardware offering that bridges the technology gap between connected and non-connected cars, working with vehicle systems to capture diagnostics, sensor data, car location, and other useful information. It includes a mobile app, a critical piece of the experience, providing a rich interface for voice-powered notifications, location-based services, and trip history and insights. Combined, Cerence Link delivers an extensive suite of features and benefits including:

- **Safety:** Driver behavior monitoring, impact detection, car location, and geofencing
- **Security:** Tow alerts and emergency calling
- **Peace of mind:** Push notifications for events such as warnings for low fuel or battery and remote monitoring of multiple cars
- **Convenience:** Vehicle status information, trip history, roadside assistance and maintenance reminders

Features:
- OBD-ported device that connects Cerence Link to the car and enables integration and interaction with the car's sensors, accelerometer, and more.
- iOS and Android mobile app interface, including AI-powered voice assistant, location-based services, and more.

Beyond the consumer applications, Cerence Link serves automotive enterprises to leverage vehicle data to deliver better customer service, improve customer loyalty, and grow

service revenues. Provides a direct information feed to understand vehicle usage patterns and generate input for future product planning.

For fleet owners and operators, it monitors vehicle and driver data and analyze driver behavior and safety to lower maintenance and insurance costs and ensure regulatory compliance.

For telcos, it increases new accounts and average revenue per user by selling Cerence Link as an accessory with additional data services and more for insurance, service, and roadside assistance providers.

Renesas to acquire India-based fabless semiconductor company Steradian

Renesas Electronics Corporation, a supplier of advanced semiconductor solutions, has entered into a definitive agreement to acquire Steradian Semiconductors Private Limited, a fabless semiconductor company based in Bengaluru, India, that provides 4D imaging radar solutions, in an all-cash transaction. The acquisition is expected to close by the end of 2022, subject to customary closing conditions. The acquisition of Steradian's radar technology will enable Renesas to extend its reach in the radar market and boost its automotive and industrial sensing solution offerings.

With the advancements of ADAS (Advanced Driver Assistance Systems) in the automotive market, automotive sensor fusion demand is growing to allow precise and accurate object detection of vehicles' surroundings by combining data from multiple sensors, such as cameras, radar and LiDAR (Light Detection and Ranging). Radar in particular accurately detects objects over long distances, day or night, even during harsh weather or other adverse environmental conditions. For these reasons, radar is considered an essential sensing technology for ADAS, and the number of radar sensors installed in vehicles is expected to triple over the next five years. To respond to such growth potential, Renesas is expanding its automotive product portfolio with Steradian's radar technology.

Founded in 2016 as a start-up company, Steradian has extensive expertise in radar technology. Operating in the 76-81 GHz band, Steradian's powerful 4D radar transceivers offer a high level of integration in a small form factor and high power efficiency. Renesas will leverage Steradian›s design assets and expertise to develop automotive radar products, with plans to start sample shipments by the end of 2022. The company aims to develop complete automotive radar solutions that combine ADAS SoCs (System-on-Chips) for processing radar signals, power management ICs (PMICs), and timing products together with software for object recognition. Collectively, these solutions will simplify the design of automotive radar systems and contribute to faster product development.

Renesas and Steradian have been collaborating since 2018, mainly in industrial applications. Steradian's radar technology is expected to be adopted in home security systems such as surveillance, traffic monitoring for people, cars and motorcycles, HMI (Human-Machine Interface) systems such as gesture recognition and docking systems in airport terminals. Steradian provides targeted solutions for these applications by offering transceiver ICs, turnkey modules that include antennas, and software stacks for object recognition.

Renesas has been actively collaborating in the Indian semiconductor space as well. In June this year, Renesas entered into a strategic partnership with two Tata Group companies - Tata Motors Ltd. and Tejas Networks Ltd. This strategic partnership will focus on the development of semiconductor solutions for technologies across automotive, IoT and 5G Systems. In addition, Renesas and Tata Consultancy Services Limited are also partnering by establishing a Joint System Solution Development Center in Bangalore, which will focus on comprehensive system solutions for the IoT, Infrastructure, Industrial and Automotive segments by leveraging Renesas' semiconductor solutions and TCS' industry experience.

Eyeris introduces In-cabin 3D Sensing AI Solution

Eyeris Technologies, Inc. introduces 3D sensing software solution which predict depth-aware vehicle interior monitoring features in 3D from a single RGBIR image sensor to further improve in-vehicle safety, comfort and convenience.

There has been increase for in-cabin 3D feature requirements, rather than 2D, from car OEMs over the last year, demanding the use of a single RGBIR image sensor, rather than stereo camera, ToF sensors or others, because of its low cost and high image quality advantages.

Eyeris uses proprietary technology that accurately regresses depth information with 3D output from 2D image sensors, which applies to all in-cabin features. It is achieved through rigorous collection of naturalistic in-cabin 3D data to train compute-efficient depth inference models that run on AI-enabled processors. The data generated can be used to map the interior of a car, for example, and accurately determine in three dimensions the location of occupants' face, body, hands, objects and everything else inside the car.

- Eyeris' monocular 3D sensing features and benefits include:
- Providing automotive OEMs and Tier 1s with robust "depth-aware" 3D data using 2D image sensors
- Enabling 3D accurate location, distance, size, and orientation estimation data, from flexible camera locations
- Providing dynamic interior 3D data transformation from world coordinate system to any OEM-specific camera coordinates (distance relative to the camera)
- Enabling new depth-dependent spatial features and use cases such as 3D in-cabin scene reconstruction, which until now, couldn't be achieved with 2D image sensors
- Maintaining the same low-computation and power requirements with efficient inference on automotive-grade processors.

6TH EDITION OF TRUCK TRAILER & TYRE EXPO - AN EXCLUSIVE EVENT ON TRUCKS, TRAILERS AND COMPONENT INDUSTRY

The Truck, Trailer and Tyre Expo is an exclusive event covering the Truck, Trailer , Tipper, Tanker, Reefer, Container Tyre and OEM's Segment . The Expo has been bringing together different Truck Manufactures, OEM's and Allied industry onto one single platform and stands as an exclusive show for the heavy vehicle industry. This is the 6th Edition of the Show that is being held in CODISSA Trade Fair Complex , Coimbatore and aims to connect the whole transport and logistic industry in the southern region.

Tamil Nadu is one of the major Automotive manufacturing hubs in India given the infrastructure and investment opportunities provided by the state government. The State has very well defined policies which has seen good investments in the state by Some of the big names in the International automobile manufacturing arena.

The Truck Trailer and Tyre Expo will be bringing in leading Truck Manufactures, Trailer Manufacturers, Tankers, Tippers, Tyre Manufactures, etc . Big Names in the Automotive industry like Tata Motors, Ashok Leyland , ISUZU Motors , Mahindra & Mahindra, JagdambaTrailers, Jamna Auto Industries along with OEMs and Tyre manufacturers like Apollo , JK Tyres, Michelin , Continental along with international companies are expected to be part of this 3 day expo thus making it the ideal platform to reach these big Manufactures and other OEMs for expanding your market reach and scout for new customers

Truck Trailer & Tyre Expo has raised the bar for the industry players in terms of product offering and cost competitiveness, leaving buyers and sellers including transporters, fabricators and suppliers mightily impressed by the one-of-its-kind exhibition being held in exclusively in this sector.

The event is supported by Ministry of Road Transport Highways & Shipping , Ministry of Petroleum & Natural Gas, Automobile Research Association of India (ARAI), International Centre for Automotive Technology (ICAT), (Indian Rubber Manufacturers Research Association (IRMRA), and other leading bodies and more than 17 Transport Associations across India which include All India Motor Transport

Congress, All India Transporters Welfare Association, Hydraulic Trailer Owners Association, Namakkal trailer owners association, Southern region Bulk LPG Transport owners association, Erode Lorry Owners Association, Namakkal Taluk Lorry Owners Association, Salem District Lorry Owners Association, Sankagiri Lorry Owner's Association, Tiruchengode Lorry Owners Association etc.

Many leading Automotive magazines including Telematics Wire which provides readers with the latest insights and developments in the automotive technology field are associated as Media Partners for the event.

TTT is a B2B event which will be visited by Decision Makers and other key personnel in the Automotive sector Industry from across the country as well as from abroad. TTT stands as a unique platform to understand, discuss and tap the evolved opportunities that the segment has to offer. The visitors would include Purchase and Marketing Department personnel, Government Officials, Members of the Transport Associations, Entrepreneurs, Dealers, Distributors, Automobile workshops owners ,Truck & Trailers Body Builders, and other interest people looking to fulfill their business needs.

The event will be open to the public from 16th December 2022 at 10:00 am onwards till 6:00 pm on 18th December 2022 and is expected to see more than 100 Exhibitors and 8000 to 10000 visitors .

For more information please contact Mr Kashif Raza on +91-9342185915 or mail on info@mediaday.co.in

Thus, the TTT Expo 2022 will offer participants an opportunity to get acquainted with the latest trends, as well as create conditions to expand cooperation and establish new business relationships that will boost investment and introduce new technologies in the Automobile sector of India. Since the event is exclusively on the Trucks Trailers Tyre and Allied Industry, the event would help organizations reach their goal of connecting with the right buyers for business expansion and brand name creation.

Driver ID: Jake R.
Distraction: NO
Seatbelt: NO
Drowsiness: NO
Smoking: NO
Cellphone: NO

Eye openness: 92%
Blinks per minute: 16
Gaze vector: 3°, 4°

Pitch: -3°
Roll: 6°
Yaw: 0°
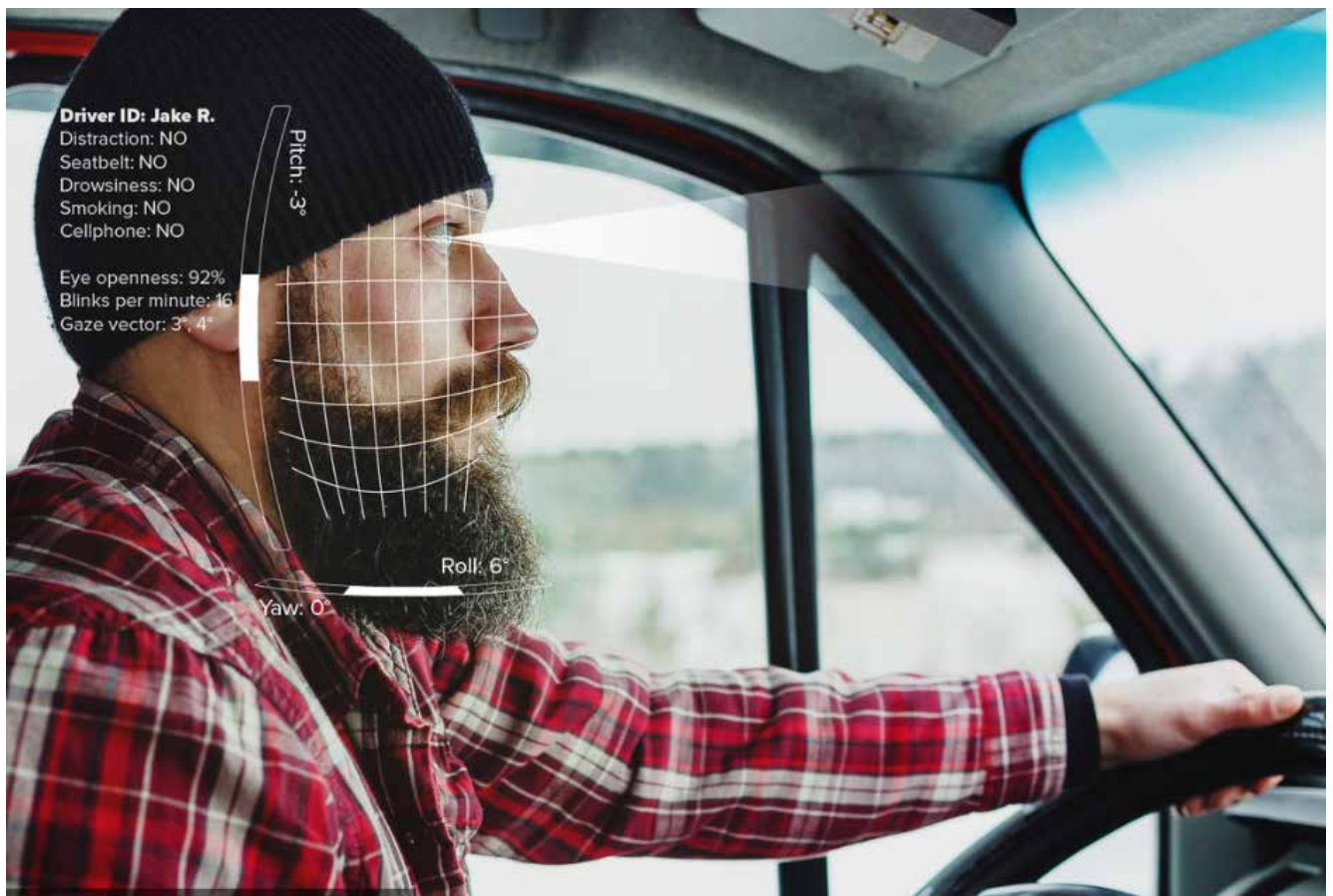
Cipia collaborates with Intel India on aftermarket driver monitoring systems

Cipia, formerly Eyesight Technologies, a provider of AI computer vision in-cabin automotive solutions, announced that it is collaborating with Intel India's Intel® Onboard Fleet Services, a comprehensive fleet safety SaaS solution exclusively designed for Indian commercial vehicle fleets. Cipia-FS10 will add Driver Monitoring features to the SaaS solution and initial deployments are underway in leading commercial fleets in India.

The Cipia-FS10 is a hardware and software solution that offers an advanced in-cabin video telematics and driver monitoring system as an aftermarket solution for the fleet industry. The Cipia-FS10 utilizes computer vision and artificial intelligence (AI) to monitor the driver's state behind the wheel, detecting driver ID, drowsiness, distraction and driver actions like phone and seatbelt use.

Intel® Onboard Fleet Services is a comprehensive fleet safety solution focused on Indian commercial vehicle fleets. Leveraging Artificial Intelligence, Intel® Onboard Fleet Services safeguards fleets and steps up operations efficiency to deliver true business advantage. The solution combines advanced driver assistance systems (ADAS), telematics, and driver monitoring systems (DMS) to enable safer and more efficient fleet management.

Yehuda Holtzman, CEO of Cipia, said, "Cipia's collaboration with Intel India is an important milestone for commercial vehicle safety. Together, we're deploying the most advanced technology to protect fleet companies, drivers, and other road users. We're ready to bring our solution to more Indian commercial fleets, providing a safer experience to drivers and other road users across the country."

Kishore Ramisetty, Vice President & General Manager, Vertical Solutions and Services Group at Intel Corporation, said, "Intel is happy to collaborate with Cipia to improve road safety at scale. Fleet owners are taking steps to ensure their drivers and vehicles are safe on the road. Intel® Onboard Fleet Services is a comprehensive solution that makes this commitment to road safety a reality.»

Argo AI products and services to serve rideshare and delivery

Argo AI unveiled its suite of products and services designed to enable businesses of any size to use autonomous vehicles to enhance ridesharing or goods delivery operations.

Argo created its product ecosystem by leveraging its years of experience developing, testing, and operating self-driving technology on multiple vehicle types and in eight diverse global cities. It also integrated input from a wide range of companies into its product design and development process, which allowed Argo to develop tools that serve ride hail and ride pooling, and middle- and last-mile delivery. It is currently operating consumer-facing ridesharing with Lyft, and autonomous goods delivery with Walmart.

Argo Connect

Argo Connect is the gateway to Argo's product ecosystem. It leverages a suite of intuitive application programming interfaces (APIs) that let businesses seamlessly integrate Argo-powered autonomous vehicles into their existing operations. Using Argo Connect, businesses can reliably schedule and dispatch autonomous vehicles to move people and packages, while creating a natural experience for their rideshare or delivery customers.

Argo Autonomy Platform

The Argo Autonomy Platform consists of the software, hardware, high definition maps, and backend support that enable Argo autonomous vehicles to safely drive in cities, suburbs and on highways. There are four products:

- Argo Drive, the self-driving software and hardware that sense the vehicle's surroundings in 360 degrees, detect other road users and predict their actions, and direct the steering, braking and acceleration to safely plan the vehicle's trajectory.
- Argo Lidar, the company's proprietary long-range sensor, capable of over 400 meters range with camera-like resolution and single photon detection to recognize dark objects, like black-painted vehicles, early and with high precision. Argo Lidar is already being manufactured and has been integrated across the entire Argo fleet in two continents.
- Argo Map, a high-definition map network built with street-level knowledge of roadways, traffic infrastructure, speed limits and more. Argo has developed a turnkey process for map expansion in existing and new markets, which enables rapid scale to new cities. In the past year, Argo doubled its total mapped mileage and added two new cities to its portfolio.
- Argo Hub, a suite of cloud tools and infrastructure to support autonomous vehicles in the field. Argo Hub includes remote guidance and remote troubleshooting support, as well as map zone management to communicate real-time road changes to Argo autonomous vehicles.
- The Argo Autonomy Platform is trained with data from extensive testing in eight cities across the United States and Germany. It's capable of navigating safely around pedestrians, bicyclists, construction, heavy traffic, and more on dense urban streets, suburban roads, and highways.
- The platform is proven to be compatible with multiple vehicle types across automakers, from electric or hybrid vehicles, to sedans, SUVs or vans. This flexibility supports a variety of go-to-market applications, from urban rideshare to middle- and last-mile deliveries.

Argo Autonomy Solutions

Running commercial autonomous services requires new operational and fleet management tools. With expertise from operating autonomous fleets across multiple cities, Argo created a portfolio of enhanced solutions for businesses to supplement in-house capabilities. They include:

- Argo Operations, a set of in-market services to help businesses seamlessly deploy and operate autonomous vehicles. Businesses can opt in to field operations teams and tools for on-the-ground vehicle management, rider and delivery customer service, and rapid response to ensure a smooth and positive end-customer experience when autonomous vehicles are on the road.
- Argo Fleet, a set of products designed to maximize fleet uptime and meet the unique service and operational needs of autonomous vehicles. This includes support for terminal activities like sensor calibration, data ingest, self-driving system startup and shutdown. It gives business owners real-time visibility into the status of each autonomous vehicle, tools to manage vehicle and personnel schedules, and access to on-site support for specialized autonomous vehicle maintenance.

Argo Autonomy Solutions are customizable and adaptable based on a business's needs, and ensure that any company can benefit from scaling autonomous services, regardless of their fleet management or operational capabilities.

Argo Data and Analytics

Every Argo-powered autonomous vehicle navigating busy city streets is generating enormous amounts of data. This rich, diverse data set is used to constantly improve Argo's products and services, while providing valuable insights to business customers.

- Argo's development footprint and daily fleet operations in multiple cities around the world exposes the Argo Autonomy Platform to complex scenarios and driving behaviors. With every new interaction, Argo can update and improve its self-driving system performance to better meet customer needs.
- When Argo-powered autonomous vehicles are in the field, they are always online, measuring performance and key metrics for specific customer use cases. Those metrics can be used to provide actionable insights to businesses to improve their logistics and in-market operations. With connected, digital fleets covering rideshare and delivery routes, companies can uncover areas for efficiency gains and optimize logistics processes.

Argo Autonomy Data and Analytics also provides real-time traffic and road insights, which could be useful to city governments, logistics companies, and other stakeholders.

Algolux extends Eos perception software to address depth limitations

Algolux Inc., the provider of robust and scalable depth perception solutions, has announced its Eos Robust Depth Perception Software. The expanded AI software offering builds on the company's advanced perception portfolio to now deliver both dense depth estimation and robust perception to further increase the safety of passenger and transport vehicles in all lighting and weather conditions.

This new offering addresses the cost and performance limitations in today's automated driver assist systems (ADAS) and autonomous vehicle (AV) platforms by applying the same breakthrough deep learning approach used by Algolux's award winning robust perception software.
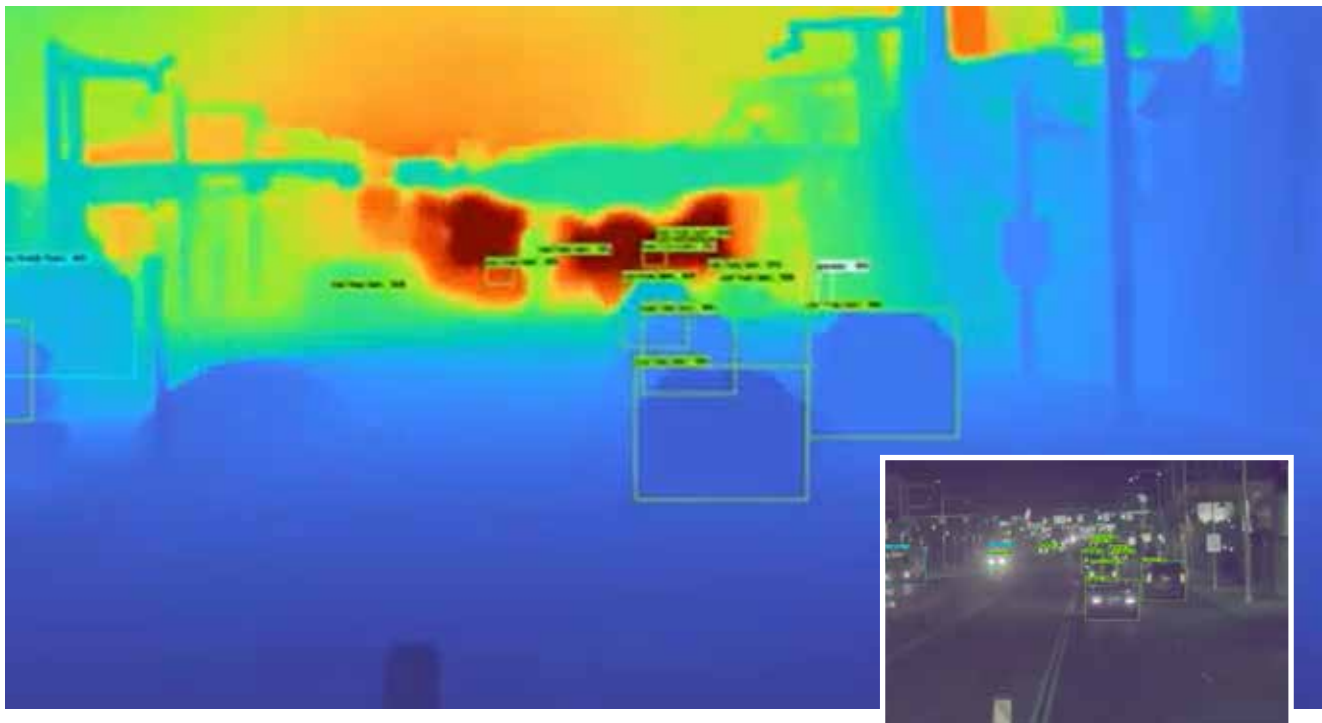
The ability to estimate the distance of an object is a fundamental capability for ADAS and automated driving. It allows the vehicle to understand where things are in its surroundings in order to know when to perform a lane change, help park a car, issue a warning to the driver, or automatically brake in an emergency situation such as for debris on the road. This is accomplished today by various types of sensors, such as lidar, radar, and stereo or mono cameras, and edge software that interprets the sensor information to determine distance to important objects, features, or obstacles in front and around the vehicle.

Unfortunately, each of the current approaches have limitations that hamper safe operation in all conditions. Lidar has limited effective range (up to 200m) due to decreasing point density the further away an object is, resulting in poor object detection capabilities, and low robustness in harsh weather conditions such as fog or rain due to backscatter of the laser. It is also costly, currently in the hundreds to thousands of dollars per sensor. Radar has good range and robustness but poor resolution, also limiting its ability to detect and classify objects. Today's stereo camera approaches can do a good job of object detection but are hard to keep calibrated and have low robustness, and mono cameras have many issues resulting in poor depth estimation.

Eos Robust Depth Perception Software addresses these limitations by robustly providing dense depth together with accurate perception capabilities to determine distance and elevation even out to long distances (1km) and identify objects, pedestrians, or bicyclists, and even lost cargo or other hazardous road debris to further improve driving safety. These modular capabilities provide rich 3D scene reconstruction and provide a highly capable and cost-effective alternative to lidar, radar, and today's stereo approaches.

Eos accomplishes this with:

- a multi-camera approach supporting a wide baseline between the cameras, even beyond 2m, especially useful for long-range applications such as trucking
- flexible support of up to 8MP automotive camera sensors and any field of view for forward, rear, and surround configurations
- real time adaptive calibration to address vibration and movement between the cameras or misalignments while driving, historically a key challenge for wide-baseline configurations
- an efficient embedded implementation of Algolux's novel end-to-end deep learned architecture for both depth estimation and perception
- the ability to detect and determine distance for typical road objects and even unknown road debris
- Algolux has proven its Eos depth perception performance in OEM and Tier 1 engagements involving both trucking and automotive applications in North America and Europe.

Hyundai and IVECO present fuel cell large van

Iveco and Hyundai have unveiled a prototype of the Iveco eDaily FCEV, as well as a pure battery electric eDaily. Iveco also showed the Nikola Tre BEV for the European market and the beta version of the Nikola Tre FCEV.

Hyundai Motor Company and Iveco Group began cooperating on commercial vehicle technology, joint procurement and mutual supply in March this year. The two companies have since been collaborating on electric powertrains and platforms, as well as hydrogen fuel cell systems. In July, the two companies announced that Iveco will use Hyundai fuel cell systems in its future hydrogen buses for Europe. The FC systems will come from HTWO, the standalone Hyundai brand announced at the end of 2020.

The Iveco eDaily FCEV is equipped with a 90 kW fuel cell system from Hyundai, a 140 kW e-motor and a battery pack from FPT Industrial, which is the powertrain brand of the Iveco Group. Six tanks provide a combined storage capacity of 12 kg of hydrogen. The prototype, with a gross vehicle weight of 7.2 tonnes, has been tested in Europe and offers a range of 350 km, a maximum payload of 3 tonnes and a refuelling time of 15 minutes. Iveco plans to produce a small series of FCEV vans based on this prototype for testing by selected customers by the end of next year.

Iveco does not go into detail about the eDaily BEV in its statement, but the two companies say that the eDaily BEV is best suited for short journeys, while the eDaily FCEV will be an ideal option for deliveries where long range with high payload is required, which generally marks the advantages of both drive types.

In the second major presentation from Iveco Group, the other hydrogen fuel cell partnership – with Nikola Motor, the US manufacturer of heavy-duty battery electric and hydrogen fuel cell trucks. This partnership recently announced the beginning of testing for Nikola Tre BEV trucks at the Port of Hamburg. Nikola Motor and Iveco have created two vehicles that they say are suited for missions of approximately 500 km (BEV) or 800 km (FCEV) given the vehicle's initial configurations.

In order to help commercial vehicle operators to afford upfront costs of zero- and low-emission vehicles Iveco has spun off GATE, standing for Green and Advanced Transport Ecosystem specifically for financing options. This spin-off is specialising in pay-per-use models. CEO Marx said this is the only way for the required rapid uptake of zero-emission vehicles that he says "will not happen through traditional ways of selling."

Automotive Cyber hacking monitoring system for South Korea

Partnered with Argus to establish a system that can monitor cyber hacking. Due to the nature of autonomous vehicles that exchange signals over the vehicle network, security threats such as hacking should be blocked in advance.

The signing ceremony at the HL Mando Pangyo Global R&D Center on the 19th was attended by HL Mando CEO Cho Seong-hyeon, HL Mando CEO Seong-hyeon Argus, CEO Argus Ronen Smallly, CTO Argus Yaron Galula, HL Clemove Vice President Hyung-jin Kang, and HL Mando Software Campus Head Jin-hwan Lee.

HL Mando's main product is automotive electrification parts. These include steering (steering) and brake (braking) parts. In the field of automobile chassis electrification, especially the autonomous driving functions of steering and braking systems where active safety functions are implemented, signals are exchanged over the vehicle network. Direct and indirect communication with the driver is mainly done through smart devices. This is why cybersecurity is on the rise. Software technology that blocks security threats such as hacking in advance is also a key task. HL Mando, which is striving to innovate in software technology, plans to build its own cyber hacking monitoring system in collaboration with ARGUS, a cybersecurity specialist. Argus' advanced defense technology is applied. HL Group's auto sector head, Seong-hyeon Cho (CEO of HL Mando) will lead the way, and HL Mando's software-related organizations will be in charge of the work. Affiliates such as HL Clemove, a company specializing in autonomous driving cognitive technology, will also participate in this project.

HL Mando said that the agreement with Argus would meet requirements for cybersecurity regulations for new vehicles adopted by WP.29, the United Nation's world forum committed to technical regulations applied to the automotive sector. The forum addresses the safety and environmental performance of wheeled vehicles and parts.

FloowFusion for conneted insurance policies

The Floow, an Otonomo company, has unveiled FloowFusion, a new technology that enables insurance providers to easily leverage connected vehicle data with existing smartphone data to power connected insurance policies. Following Otonomo's acquisition of The Floow, FloowFusion can bring together, smartphone-based insurtech solution with connected vehicle data available through the Otonomo Smart Mobility Data Platform, providing access to insights that will transform the way auto insurance is written and managed. With FloowFusion, insurance providers can easily leverage mobile and vehicle telematics data to create new connected insurance policy offerings, as well as bolster existing offerings with additional data sources to deliver a competitive advantage.

Traditional approaches to connected insurance necessitated piecemeal integrations with third-party devices or car manufacturers, creating significant technical and operational challenges for insurance providers. FloowFusion delivers telematics data that is source agnostic. With the improved accuracy and predictive power of The Floow's telematics data, insurers can better measure driver risk and price policies compared to traditional risk models alone. With access to near-real-time driving behavior data, insurers can create greater pricing sophistication, improve customer experiences, and identify risks to drive stronger resilience against market shifts.

The following key features and benefits of FloowFusion will be embedded in and supercharge FloowDrive and FloowKit – the existing successful offerings from The Floow – without adding any complexity:

- Intuitive, Customizable In-App Experience: FloowFusion adds an easy-to-use interface with a simple vehicle registration process. It is clearly integrated into the scoring dashboard, dynamic localization and native UI conventions, enabling insurers to easily drive end-user adoption and engagement. Integration of FloowFusion in the existing The Floow applications remains highly customizable and configurable, allowing insurers to meet their unique branding specifications across the end-user app and any policyholder communications.
- Streamlined User Onboarding: FloowFusion's onboarding communications are user-simple, keeping the registration process more efficient for the policyholder and the insurer, promoting policyholder engagement. By reducing friction in the set-up process, insurers can drive greater adoption.
- Highly Scalable with Rapid Deployment: FloowFusion is easily scalable to support small-scale pilot programs, as well as large-scale, global deployments. With rapid deployment options, FloowFusion as part of FloowDrive and FloowKit, can be deployed in weeks, compared to existing solutions that can take several months to deploy.
- Cost Effective: The Floow's app-based, out-of-the-box solution provides substantial cost savings compared to existing solutions on the market that require custom deployments, delivering a greater return on investment.
- Connected Vehicle Data Consent: FloowFusion allows insurers to easily manage driver data sharing regulation compliant user consent, giving end users full control over how and when their driving data will be used.
- Automated Collection of Vehicle Data: With FloowFusion, insurers are able to automatically capture relevant vehicle data based on configurable time frames. This allows insurers to access the data they need to support their insurance program at the required intervals.

ZF unveils autonomous commercial transportation system solutions

ZF's Commercial Vehicle Solutions (CVS) division presented its latest range of future-ready automation technologies and expertise at IAA Transportation 2022. This includes ZF's innovative next generation Autonomous Driving Open Platform Technology (ADOPT) automated chassis control solution. The advanced platform bridges autonomous vehicles' virtual driver software with its actuation systems using standardized interfaces developed to automotive standards. Providing autonomous driving capabilities, ADOPT translates driving instructions into safe vehicle motion control commands. This includes automated hub-to-hub transportation on highways with ADOPT 3.0 and, for fully integrated yard automation, ZF's ADOPT 2.0 in combination with its new SCALAR fleet orchestration solution.

An Autonomous Driving 'One-Stop-Shop'

ZF's extensive commercial vehicle automation portfolio ranges from the supply of Level 4 autonomous driving vehicle chassis components and controls, sensors, high-performance computers through to advanced digital and connectivity technologies. Bringing these capabilities together, ZF can provide customers with full turnkey solutions, including virtual driver and automated traffic orchestration software solutions. This enables design solutions to be flexibly integrated within a commercial vehicle manufacturer's automated vehicle platform or combined with the automation solutions and services offered by new automotive companies.

As an intelligent control interface to support autonomous vehicle motion control systems, ZF's next generation ADOPT solution represents an important step forward for autonomous driving. ZF showcased high-speed Level 4 autonomous driving with a demonstration vehicle which was equipped with ZF's gearbox and OptiRide Electronically Controlled Air Suspension System as well as its third generation EBS system interfacing with the ADOPT 3.0 chassis control software for speeds up to 80 km/h. The combination demonstrated high stability control even on wet roads and surfaces with uneven friction.

ZF also demonstrated a full turnkey yard automation solution using a driverless tractor unit to move semitrailers. Equipped with ZF's ReAX steering, OptiRide ECAS, third generation EBS, Fail Operation Braking System and Fail-Safe Park Brake, it performed fully automated yard maneuvers such as docking and coupling. Up to 50% quicker, auto-coupling helps improve productivity as well as supporting less experienced drivers. The vehicle was controlled by a combination of ZF's new ADOPT 2.0 software for speeds up to 20km/h interfacing with Embotech's path planning and perception software. This demonstration also showed how ZF can leverage its SCALAR orchestration technology to automate the planning, routing and dispatching of vehicles in a yard environment.

The Confederation of Indian Industry – Southern Region has been organising Autoserve - India's Largest & Focused Exhibition on Automotive Care, Maintenance, Service, Parts & Garage Equipment with an objective to bring more awareness on the latest trends & technologies and to offer a platform for sourcing & networking for the Indian Automotive Aftermarket segments.

The 10th edition of Autoserve 2022 is scheduled from 11 – 13 November 2022 at Chennai Trade Centre, Chennai, India. The Event will focus on the latest trends, innovations, start-ups, skill development, R&D, equipment & technologies in the Automotive Aftermarket Sector and would provide a platform to various stakeholders to learn the best practices and deliberate on the opportunities to build a strong growth trajectory for the Automotive Aftermarket Industry.

Industry leaders such as TVS Automobile Solutions, Castrol, Schaeffler India, TVS Srichakra, 3m India, Brakes India, Hella India Lighting, JIT Techlabs, Lucas TVS, Mansons, Uno Minda, Henkel, JK Fenner, Suprajit Engineering, Ucal, Varroc Engineering, ZF Group, Lucas Indian Service, Sundram Fasteners, Anabond, India Nippon Electricals, Osram, Paracoat products and many more are exhibiting their products and services.

As part of Autoserve, An International Conference on Automotive Aftermarket will be organised on 11 November 2022. The Conference will focus Changing dynamics & Digitalization in the Automotive Aftermarket Industry, Automotive Aftermarket Garages, Indian Tyre Market (Aftermarket) and Genuine Spare parts Vs Counterfeit Parts in Aftermarket.

Eminent speakers from leading OEMs, Automotive Manufacturers, Technology/Service Providers, Auto components Manufactures & Government Departments etc., will be addressing the Autoserve Conference. More than 300 senior management personnel from diverse industries all over India and abroad are expected to attend this conference.

The event is expected to witness 120+ Exhibitors, 12000+ Business & Trade Visitors, International Brands Representation, B2B Meetings and Networking with CEO, Skill Development and Workshop Session, New Product Launches and Supported by Sectoral Associations.

www.ciiautoserve.in

QUANTRON to unveil hydrogen fuel cell truck equipped with Allison eGen Power® electric axle

Allison Transmission, a designer and manufacturer of conventional and electrified vehicle propulsion solutions, announced German vehicle manufacturer QUANTRON has integrated the Allison eGen Power® 130D e-Axle into its new fuel cell electric vehicle (FCEV), a heavy-duty truck capable for tractor and chassis derivatives based on the MAN TG3 platform (TGS, TGX).

The QUANTRON FCEV truck has 54 kilograms of on-board hydrogen storage with fuel cells supplied by Ballard Power Systems, delivering 240 kilowatts of clean power into a 118 kilowatt-hour battery pack to support a range up to 700 kilometers in the displayed version QUANTRON QHM FCEV 44-1000. The vehicle is available for orders in 4×2 and 6×2 axle configurations, with availability for customer testing in 2023.

At the heart of the truck is the Allison eGen Power 130D electric axle, which combines two electric motors and a two-speed transmission in one compact unit. The two integrated electric motors deliver a total of 454 kW of continuous power and up to 652 kW of peak power. QUANTRON will be the latest customer to integrate the eGen Power 130D, which was specifically designed to operate in commercial vehicles in European and Asia Pacific markets. Allison's eGen Power family of e-Axles includes two additional variants developed to address the wide range of markets Allison serves.

StoreDot ships EV cell samples of its '100in5' battery technology to global car makers

StoreDot silicon-dominant EV battery cell samples shipped worldwide

StoreDot has commenced shipping EV cell samples of its '100in5' battery technology to strategic electric vehicle OEM partners and potential customers.

Following the successful completion of series D funding round, StoreDot commences shipping its production ready battery cell samples to global Electric Vehicle OEMs. It represents another significant step on StoreDot's roadmap to begin mass-producing its '100in5' battery cells during 2024, and to deliver a step-change in global EV adoption. This technology provides 100 miles of range in just 5 minutes consistently and without compromising battery's health.

Shipped in EV form factor, the 30Ah silicon-dominant anode, lithium-ion pouch cells are currently undergoing intensive real-world testing with strategic OEM partners and other automotive players.

StoreDot has already proven the effectiveness of its extreme fast charging – XFC – battery in public during a highly attended live demonstration in Oslo in June, at The International Electric Vehicle Symposium (EVS), one of the key conferences for the EV industry. StoreDot is currently working on mass production readiness of its '100in5' cells with its long-standing manufacturing partner, EVE Energy in China, in parallel to expanding its global manufacturing footprint in other geographies.

Elektrobit and Argus Cyber Security announce automotive switch firmware pre-integrated with cyber security functionality

Elektrobit and Argus Cyber Security announced the launch of EB zoneo SwitchCore Shield, a pre-integrated solution of embedded intrusion detection and prevention (IDPS) functionality within advanced network management systems for next-generation vehicles.

The joint solution is an automotive-grade switch firmware for E/E architectures that pre-integrates Argus Ethernet IDPS, a cybersecurity protection layer for automotive Ethernet networks, as an embedded module. This production-ready solution reduces carmakers' integration costs and risks while accelerating new vehicles' time to market. Building upon decades of automotive expertise from Elektrobit and Argus, this breakthrough solution allows carmakers to evaluate data detected and quickly determine actions required to confront an attempted cyber-attack.

EB zoneo SwitchCore Shield also enables carmakers to comply with emerging cyber security regulations, such as UN R155 and Chinese GB/T, and also takes security a step further, providing an additional layer of threat prevention via Argus Ethernet IDPS for increased interoperability with Classic AUTOSAR systems.

Garrett Motion highlights importance of advanced cybersecurity software for commercial vehicle fleets

Garrett Motion Inc. unveiled its connected vehicle software solutions that help automakers effectively secure, optimize, and maintain their fleets. Garrett's cybersecurity solutions help safeguard against cyber-attacks, ensure regulatory compliance, and identify root causes to optimize a vehicle's performance and integrity.

The Garrett cybersecurity management solution consists of four core products:
- CAN IDS (Intrusion Detection System) – Onboard IDS that monitors CAN traffic and detects or blocks irregularities. IDS also operates independently from the vehicle's hardware and operating system.
- Ethernet IDS – Ethernet Firewall and IDS that analyzes and controls Ethernet traffic and blocks malicious messages onboard.
- Host IDS – Host IDS monitors and detects anomalous cyberattacks on high-performance automotive computers.
- SOC (Security Operation Center) and (SIEM) – Analytic and forensic tools for the Security Operations Center (SOC) and Security Incidents and Events Management (SIEM) that help understand root cause of an onboard alert, saving time and money for OEMs and fleet operators. It combines Security Information Management (SIM) and Security Event Management (SEM) for real-time analysis of security alerts from source applications and network components. SIEM thus serves the safety of the truck and is a software product that can be installed centrally, analyzing cyber alerts from millions of vehicles.

HiRain's Autonomous Truck Infrastructure, Source: Beijing JingWei Hirain Technologies

Arbe and HiRain Technologies selected to provide perception radars for autonomous trucks and AGVs across ports in China

Arbe Robotics Ltd. anno unced that HiRain Technologies, the Chinese ADAS Tier 1 supplier, was selected by the Port of RiZhao in Shandong Province to provide perception radars based on Arbe's chipset. The deployment has been implemented on FAW Trucks and on automated guided vehicle (AGVs), providing autonomous driving capabilities, advanced perception, and true safety. The first deployment started at the RiZhao port and is expected to expand to additional ports across China.

Perception radar is revolutionizing the capabilities of autonomous vehicles due to its ability to detect and classify objects in ultra-high resolution and in any weather or lighting condition. HiRain's perception radar solution based on the Arbe chipset has the highest channel count in the industry with 48 transmitting channels and 48 receiving channels and provides free space mapping of the full surroundings of the vehicle. The radar solution was chosen for its effectiveness in highly dense port environments to increase staff safety, reduce operational risks, and enhance efficiency. The parties plan to expand the deployment to highways by supporting port-to-port autonomous driving.

Standard Motor Products expands ADAS program offering

Standard Motor Products, Inc. (SMP) continues to expand its aftermarket-leading ADAS program. ADAS in today's vehicles is already helping to save lives and prevent injuries. Minimizing human error has been identified as a key factor in reducing the number of vehicle collisions resulting in serious injury and death. Standard® is dedicated to continuously adding new product categories and late-model applications to meet industry demand.

Standard® ADAS components are direct-fit replacements, designed to match the damaged or failed OE units they are replacing. This ensures correct integration with the vehicle's electronic safety systems. Standard® goes to great lengths in the quality testing and product validation processes to deliver precision performance. Standard's ADAS product line includes Park Assist Cameras and Sensors, Cruise Control Detection Sensors, Blind Spot Detection Sensors, Lane Departure System Cameras, and Steering Angle Sensors for a complete line of ADAS components. Standard's ADAS program features over 550 part numbers and represents over 800 million repair opportunities for gas, EV and hybrid, domestic and import vehicles.

BlueCruise adds hands-free lane changing, tech to make road-sharing easy with bigger vehicles on key 2023 models

Ford Motor Company launched BlueCruise 1.2 and Lincoln ActiveGlide 1.2 with new features – including hands-free lane changing – and system updates to create more of a human-like driving feel. The available new system starts arriving on vehicles from the factory this fall – beginning with the Ford Mustang Mach-E. Available BlueCruise 1.2 and ActiveGlide 1.2 include three new features:

Lane Change Assist can help drivers move through traffic on the freeway with more confidence while using BlueCruise. The system will perform a hands-free lane change when requested by the driver tapping the turn signal, and it can even suggest if a lane change would be beneficial when following slow-moving traffic.

Predictive Speed Assist automatically and smoothly adjusts the speed as drivers approach a sharp curve and will help signal the driver ahead of time when a speed change is about to occur, so they understand why the vehicle is slowing.

In-Lane Repositioning makes the hands-free highway driving experience feel more natural, keeping the vehicle in its lane while subtly shifting the vehicle's position away from vehicles in adjacent lanes.

Once a pre-qualified road is identified, BlueCruise-equipped vehicles sense and help confirm lane lines are visible, the driver has his or her eyes on the road and other conditions appropriate before transitioning to hands-free driving. BlueCruise uses animated cluster transitions featuring text and blue lighting cues to communicate that the feature is in hands-free mode, effective even for those with color blindness.

Oxford researchers develop new AI to enable autonomous vehicles to adapt to challenging weather conditions

Researchers at Oxford University's Department of Computer Science, in collaboration with colleagues from Bogazici University, Turkey, have developed a novel artificial intelligence (AI) system to enable autonomous vehicles (AVs) to achieve safer and more reliable navigation capability, especially under adverse weather conditions and GPS-denied driving scenarios. The results have been published in Nature Machine Intelligence.

Yasin Almalioglu, who completed the research as part of his DPhil in the Department of Computer Science, said: 'The difficulty for AVs to achieve precise positioning during challenging adverse weather is a major reason why these have been limited to relatively small-scale trials up to now. For instance, weather such as rain or snow may cause an AV to detect itself in the wrong lane before a turn, or to stop too late at an intersection because of imprecise positioning.'

To overcome this problem, Almalioglu and his colleagues developed a novel, self-supervised deep learning model for ego-motion estimation, a crucial component of an AV's driving system that estimates the car's moving position relative to objects observed from the car itself. The model brought together richly-detailed information from visual sensors (which can be disrupted by adverse conditions) with data from weather-immune sources (such as radar), so that the benefits of each can be used under different weather conditions.

The model was trained using several publicly available AV datasets which included data from multiple sensors such as cameras, lidar, and radar under diverse settings, including variable light/darkness levels and precipitation. These were used to generate algorithms to reconstruct scene geometry and calculate the car's position from novel data. Under various test situations, the researchers demonstrated that the model showed robust all-weather performance, including conditions of rain, fog, and snow, as well as day and night.

The team anticipate that this work will bring AVs one step closer to safe and smooth all-weather autonomous driving, and ultimately a broader use within societies.

The cold chain tracking solutions market set for rapid growth

Installed base of active refrigerated cargo and cargo container tracking devices (World 2021–2026)

Berg Insight released a new market report covering the cold chain tracking market. The number of active tracking devices deployed for refrigerated cargo and cargo carrying units including trailers, intermodal containers, rail freight wagons, air cargo containers, cargo boxes and pallets reached 4.1 million worldwide in 2021. Growing at a compound annual growth rate (CAGR) of 17.4 percent, this number is expected to reach 9.2 million by 2026. In terms of installed base, tracking devices for general refrigerated cargo applications is today the largest market, followed by refrigerated intermodal containers and trailers. The markets for tracking solutions for refrigerated rail freight wagons and air cargo containers are considerably smaller. The total market value for cold chain tracking solutions reached an estimated € 720 million in 2021. Growing at a CAGR of 11.4 percent, the total market size is forecasted to reach € 1.2 billion in 2026.

The cold chain tracking and monitoring market is served by a wide range of players. Maersk has rolled out a system for real-time tracking of its entire fleet of 385,000 refrigerated containers, making it the largest refrigerated cargo container tracking project worldwide. ORBCOMM is the second largest player in terms of the number of connected units with an estimated 380,000 units installed on both refrigerated trailers and reefer containers. The Denmark-based tracking specialist Globe Tracker is the third largest provider of tracking solutions for refrigerated cargo carrying units. The company is collaborating with the major shipping company Hapag-Lloyd to equip the ocean carrier's entire fleet of around 140,000 reefer containers with tracking units. Additional leading players in the refrigerated intermodal container and trailer tracking segment include Envotech, Cooltrax, Emerson, Spireon, Schmitz Cargobull, CalAmp and Idem Telematics. DeltaTrak, Sensitech (part of Carrier), Controlant, Tive and Frigga (part of Dewav Electronic Technology) are leading players in the refrigerated cargo tracking segment, each with more than 100,000 active trackers at any given time. Additional players in the segment include OnAsset Intelligence, Roambee, Adapt Ideations, Tempmate, Escavox, 7PSolutions and Intelyt.
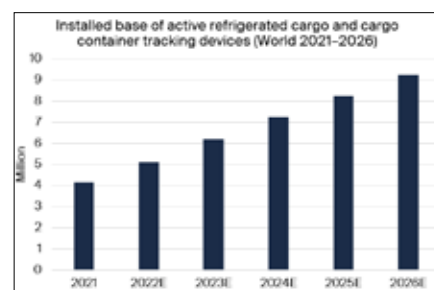
Guidehouse Insights explores opportunities for municipal transportation operating systems

A new report from Guidehouse Insights explores how municipal transportation operating systems (MTOS) can manage and optimize urban mobility. Cities are continually responding to urban transportation challenges such as increasing levels of travel demand and the complex management of numerous modes of both public and private transportation. The rising demand for passenger transportation and urban deliveries increases congestion and results in a significant impact on air quality, safety, and quality of life. According to a new report from Guidehouse Insights, the expanding number of modes of urban mobility, such as shared micromobility, and the anticipated arrival of highly automated vehicles is increasing complexity and driving the need for real-time data to manage transportation systems efficiently.

Stakeholders in the mobility ecosystem—including automakers, mapping data companies, and technology companies—are developing solutions to address urban mobility challenges and piloting them in cities around the world. These systems could form key components of an MTOS to manage and optimize future urban mobility. Besides delivering better transportation service to customers, an MTOS could provide cities with the tools to monitor mobility services and help model future system upgrades and new transportation policies, according to the report.

The report, Cities Should Now Evaluate the Benefits of Municipal Transportation Operating Systems, examines the mounting pressures on cities to provide efficient, safe, and sustainable mobility systems and considers how an MTOS could provide an effective solution. It features some of the notable pilots being conducted in various cities that develop and demonstrate the benefits these technologies offer. Recommendations are provided for how key stakeholders can benefit from the development of MTOSs and provide maximum value to cities.

Targa Telematics signs a partnership with Mercedes-Benz Connectivity Services to enlarge its connected mobility solution portfolio

Targa Telematics, a tech company specialised in the development of digital solutions in connected mobility, has signed a partnership with Mercedes-Benz Connectivity Services GmbH, a subsidiary of the German manufacturer dedicated to digital data solutions.

With this collaboration, Targa Telematics becomes a "Trusted Partner" for the integration of technology platforms and the development of connected car solutions. Targa Telematics' platform will be able to integrate data via an API/interface developed by Mercedes-Benz Connectivity Services. This will enable Targa Telematics to provide numerous services to its customers, simplifying the provisioning process on Mercedes-Benz vehicles. This process is available for all the customers that will consent in advance in accordance with the GDPR. Data protection and GDPR-compliant data processing are constantly ensured by a mutual control mechanism between Targa Telematics and Mercedes-Benz Connectivity Services.

This is a further step for Targa Telematics, which continues to enhance its partnerships and strengthen its leadership in mobility solutions for large fleets, short and long-term rentals, finance and insurance companies.


TomTom's GO Navigation app introduces truck navigation

TomTom (TOM2), the mapmaker and geolocation specialist, has introduced GO Navigation's truck plan – an offer designed to meet the needs of professional truck drivers. In addition to GO Navigation's premium navigation capabilities, this enables drivers to plan routes that account for their vehicle's dimensions, fuel requirements, desired maximum speeds and cargo (such as dangerous goods).

Drivers will also be able to plan multiple drop-offs and gain access to an overview of upcoming points of interest (POIs) – such as fuel stations suitable for their vehicle and truck stops. These truck- specific additions work in conjunction with the app's existing navigation features, including intuitive lane guidance, live traffic and the Route Bar – a convenient snapshot of the route, stops, relevant alerts and restrictions ahead.

The TomTom GO Navigation's truck plan user interface (UI) is designed to minimize distractions and keep attention on the road – something that's especially important for anyone operating heavy vehicles over long, fatiguing distances. And with Android Auto™ compatibility, drivers also have the option to sync their route with their in-dash screen.

RoadMedic® and BlackBerry deliver next-gen 9-1-1 Intelligent Crash Sensor Data Platform
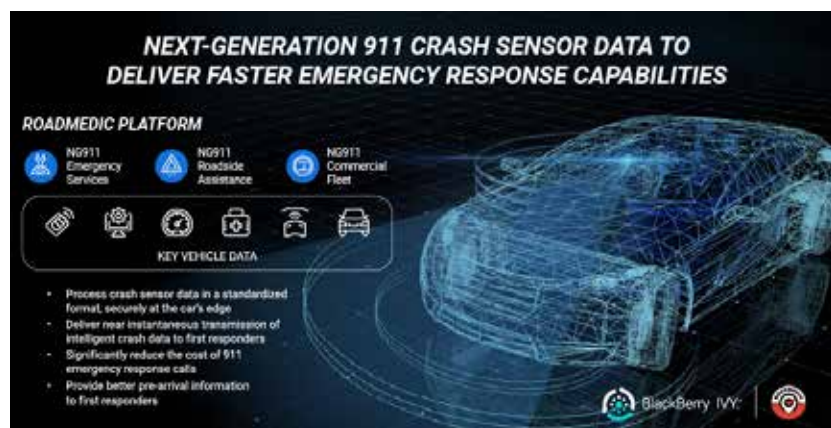
Automotive 9-1-1 software provider Roadside Telematics Corp. (RTC) has joined the growing BlackBerry IVY™ ecosystem of partners to help drive adoption of its RoadMedic® Intelligent Crash Data Platform which will enable automakers and self-insured commercial fleets, such as rental car companies, public sector fleets, and trucking firms, to deliver faster and more efficient 9-1-1 emergency response capabilities.

BlackBerry IVY is a scalable, cloud-connected software platform providing automakers a secure and reliable way to share real-time vehicle crash sensor data. The two companies will combine artificial intelligence and machine learning technologies to process crash sensor data efficiently and securely at the car's 'edge' with far less computing power than is traditionally required, enabling the near instantaneous transmission of intelligent crash data to first responders. Automakers will be able to use the combined platform to deliver faster, more efficient, more effective Next-Generation 9-1-1 (NG911) emergency response.

As part of the collaboration, BlackBerry IVY will further secure end-to-end data integrity between crash sensors in the vehicle and NG911 public safety while RoadMedic will reduce network overhead and latency localizing crash data processing to the car.

Ideanomics and ABC Companies to accelerate the deployment of WAVE wireless charging solutions

Ideanomics announced an agreement with ABC Companies, a provider of motorcoach, transit and specialty passenger transport equipment in the USA and Canada, allowing ABC Companies to become a certified reseller of WAVE's wireless inductive charging technology in North America. The resale partnership expands WAVE's distribution across North America and into private charter fleets.

ABC Companies and WAVE, a subsidiary of Ideanomics, executed this agreement. This collaboration builds on the successful deployment of the WAVE charging system to select ABC customers. With systems ranging from 125kW to 500kW and a 1MW charger in development, WAVE wireless charging unleashed the full potential of EV fleets by maximizing operational efficiency and reducing the total cost of ownership.

At the heart of WAVE's wireless charging solution is a proprietary ruggedized and fully automated charging pad. High power is delivered over the air from the roadway-embedded charging pads to receivers mounted on a vehicle's undercarriage. Charging begins as soon as the vehicle aligns on top of the in-ground pad. The WAVE system is easy to operate and maintain, with no moving parts or overhead charging infrastructure. As an added benefit, WAVE wireless charging is one of the most reliable ways to charge electric vehicles. It requires no incremental labor for manual operations and zero handling of high-power cables.

AB Dynamics Group acquires Ansible Motion

AB Dynamics plc has acquired Ansible Motion Limited, a provider of advanced simulators to the global automotive market. The acquisition was announced on September 21st for a total fee of £31.2m, which comprises a £19.2m initial consideration and a £12m payment subject to meeting certain performance criteria.

Ansible Motion will become part of the Group's simulation portfolio supplying advanced simulation products and services to the automotive and motorsport industries. Ansible Motion will sit alongside the newly formed AB Simulation division (responsible for the Advanced Vehicle Driving Simulator (aVDS) product range) and rFpro (market-leading simulation software provider) which was acquired in 2019.

Ansible Motion's current product range includes the Delta series dynamic simulator, the Sigma series static simulator and the compact, portable Theta series simulator. They are used for the development of a range of ground vehicle applications, including ADAS, autonomy, motorsport, chassis, powertrain, human factors, Human-Machine Interface (HMI), NVH, steering systems and tyres.

GM and OneD Battery Sciences collaborate on joint R&D of silicon anode technology for more efficient EV batteries

General Motors Co. and OneD Battery Sciences announced the execution of a joint research development agreement focused on the potential use of OneD's silicon nanotechnology in GM's Ultium battery cells to drive significant increases in energy density for longer range and reduced cost. GM Ventures and Volta Energy Technologies also participated in OneD's Series C funding round, which the company recently closed at $25 million.

The focus of the collaboration is OneD's SINANODE platform, which adds more silicon onto the anode battery cells by fusing silicon nanowires into EV-grade graphite. Silicon can store 10 times more energy than graphite. Increasing energy density can open the door to smaller, lighter, more efficient battery packs that could achieve higher driving range at lower cost.

The collaboration on silicon anode technology is believed to be the first of its kind between two American companies. GM is rapidly scaling its Ultium EV Platform to reach 1 million units of annual EV manufacturing capacity in North America by 2025.

HEADLINES

- **VinFast and Renesas sign strategic partnership to advance automotive technology**
- **TeamViewer and Hyundai Motor sign strategic partnership to accelerate digital innovation in automotive smart factory**
- **Senmiao Technology announces signing of cooperation agreement with New Energy vehicle leasing and charging station operator in Guangzhou**
- **Werner Enterprises and Kodiak Robotics collaborate to run 24/7 long-haul autonomous freight operations**
- **Hertz, bp collaborate to accelerate EV charging in North America**
- **LG Energy Solution partners with three Canadian suppliers to augment key battery material supply chain in North America**
- **GM and Lithion announce an investment and strategic partnership agreement to pursue a circular EV battery ecosystem**
- **Valens Semiconductor collaborates with Intel to boost automotive MIPI A-PHY implementations**
- **Dayin Technology selects BlackBerry to develop acoustic solutions for Great Wall Motors' premium, next-generation vehicles**
- **BorgWarner to acquire charging business of Hubei Surpass Sun Electric (SSE)**
- **Siemens and Shell sign MoU to advance low-carbon, highly efficient energy solutions**
- **ABB expands US manufacturing footprint with investment in new EV charger facility**
- **Senmiao Technology announces signing of agreement with SOE Affiliate for online ride-hailing vehicle and driver resources in Chengdu**
- **Mercedes-Benz Vans and Rivian move to partner on electric van production**
- **CATL and BMW Group reach framework agreement on cylindrical battery supply**
- **Together for Safer Roads announces partnership with VisionTrack**

14 **15**

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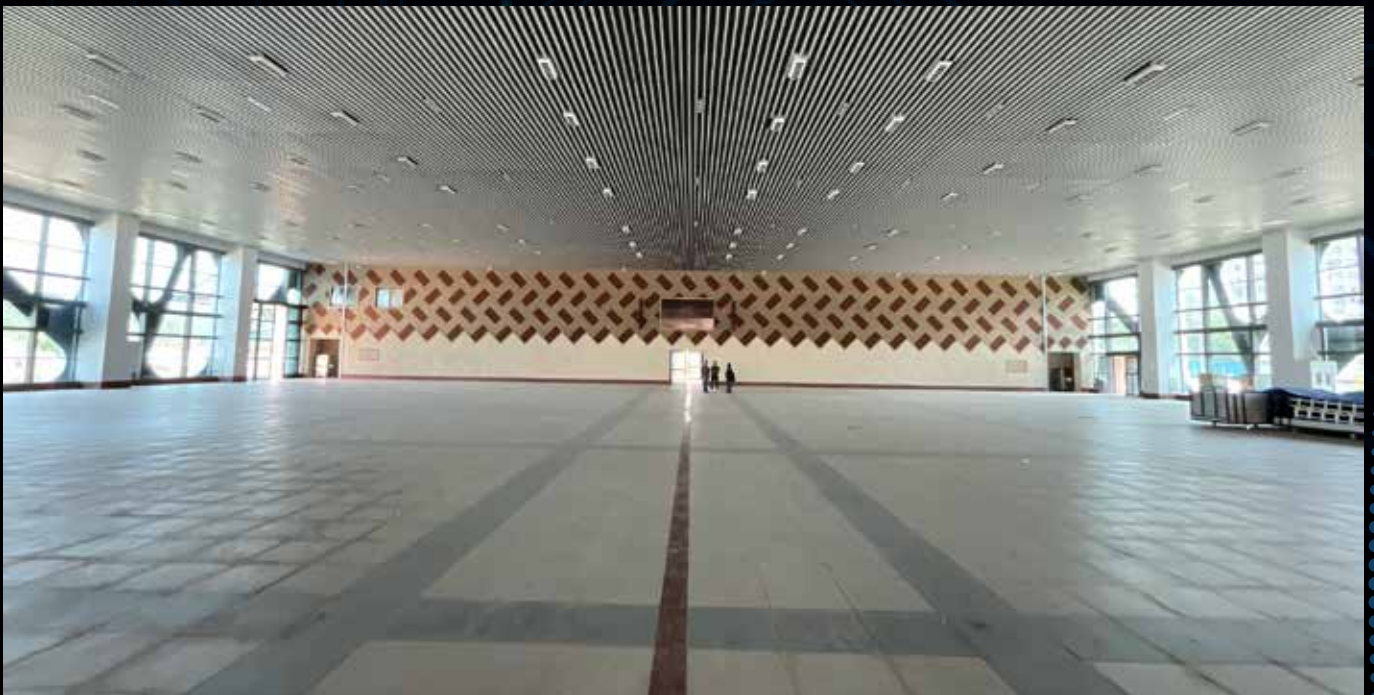- Telematics
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Tata Communications Ltd.

"Your car is unique to you. It has been built for you based on your needs and tastes". Sounds far-fetched? This could become a reality in the next couple of years. Soon, each car will be built around individual user requirements and automotive companies are gearing up

to build highly personalized cars for that individual or group of individuals. Already, modern day cars are built with a base design that can be customized to fit the needs of a user. Many features are either software based or easy bolt-on features. Vehicle connectivity capabilities become critical for hyper personalization, as consumer

needs and likes change over the ownership lifespan of the car. The advent of electric vehicles has simplified the manufacturing processes for manufacturers. A basic car has a body, battery, drive, motor, wheels, and a few other components, all other additional features are mostly software based, running on multiple onboard computers. Just like any other smartphone or tablet application, these software components require periodic updates and feature additions. This is enabled using 'Over the Air' updates, referred to as SOTA (Software Over The Air) and FOTA (Features Over The Air).

Let me explain. Our smartphones, tablets, laptops, and other electronic devices receive updates periodically. These updates are downloaded while you use the device, in the background, and replace or augment the existing piece of technology. The device software is updated over the air, or a new feature is downloaded and

installed over the air.

What if your car could speak with you to understand your choices? You could talk to the vehicle and request new features and app downloads. What if the car could identify certain internal issues or predict mechanical failures, and proactively alert your local dealer or manufacturer about the same. Wouldn't that be an interesting evolution in customer service? This is already happening to an extent, with some vehicles, with other future proof features in the works. All of these are possible because the cars are connected digitally – to the user, the manufacturer, the dealer, the internet and to the world. Let us delve a bit deeper.

Personalization from design to road

Every car model has its unique formula which is a culmination of the operational practices followed through its design and manufacturing cycles. This process defines the luxury, comfort and safety levels for the customer and the consequent economic value they derive from it. The journey of buying a perfect car starts at its design and in the factory, long before it catches the eye of a customer. The digital enablement of the car does not start on the road, but it begins much earlier in the research lab and the design studio. From this initial phase a vehicle takes form on the smart factory floor. The connected car is designed to be

safe, efficient, and comfortable and these features cannot be an afterthought. Many components inside a car are designed in a way that the software running on them can be updated to offer different features or functionalities as per the user's choice. Thus, the car is seeded digitally if we may say so. The digitalization journey then continues into its manufacturing process.

Along the production line, as each stage of the car is built, new features are embedded as software applications into the car. These are highly personalized based on the region where the car will be used, the regulations of that country, the choices expressed by the user and various other factors. At the end of the manufacturing process, no two cars will be the same. When the car reaches the user for the first time, it is already personalized. As the user drives the car around, they could use OTA enabled features to further personalize the car based on their changing needs. So, every car, in the future, will be born digital, intelligent and connected.

Personalization of the car

We can look at personalization of the car in three major areas – the telematics of the car, infotainment within the car and in-car applications. Car telematics help the user to use the car optimally and proactively become aware of the issues that may arise in the car, and get the problems rectified.

The manufacturer can collect information about the car's performance and can proactively reach out to the user in case of any abnormalities. Infotainment comprises high quality music, video, car based or cloud games, and other such content, which is enabled through the connected car infrastructure. The connected car can provide personalized recommendations to the user on-demand. The third and final aspect is quite important. It comprises of various features like driver assistance, other safety applications, voice navigation, and other similar applications. Each of these choices is different for each user and is achieved using a combination of software and ubiquitous connectivity.

5G Connectivity for the car

One of the key enablers for this hyper-personalized connected car is the fact that it maintains high quality connection to a mobile network. Not just any mobile network - if the full capability of personalization has to be derived, we need a high-speed, always-connected mobile network service that can promise low latency and high reliability. This implies that the car has to connect with at least a 4G, and preferably 5G network to ensure that it is truly "connected". Similarly, during the manufacturing process, the car, and the production line, should both be connected using a very reliable 5G network to ensure

all the personalization happens along the production process. During the design of the various onboard computers, it is essential to incorporate a 5G modem as the medium of communication. The embedded computers inside the car are connected to the external world using this dependable 5G link.

5G in the manufacturing process

Apart from connecting to onboard computers using a 5G network, the manufacturing line also requires reliable inter-connected machines and to ensure connection to central controllers of the production process. At present most production lines are connected using dedicated cabling, or other wireless technologies such as Wi-Fi. By upgrading to a 5G connection, many inefficiencies can be eliminated from the production process. For example, adding a new machine or a robot in the line, re-ordering the line, introducing new steps or any dynamic changes can be easily carried out if the machines are interconnected using a wireless 5G network. Similarly, moving assets around a factory or warehouse, including automated guided vehicles or drones, which are used in the production process for fetching raw materials or any other activities inside the factory can be seamlessly connected with a private 5G network, as cellular connection inherently supports mobility. Multiple ultra-high definition (UHD) cameras can be used to inspect the quality of incoming raw materials or the car itself at various steps using an edge computer placed inside the manufacturing unit, vision systems / video analytics running in the edge computer, and a reliable high-speed 5G connection. There are many examples that demonstrate how a 5G network can enhance the design and manufacturing process of a car. The network itself can be a slice of a public 5G network or can be custom built for the factory as a 5G Private network.

5G network while in use

SOTA / FOTA feature enables a vehicle manufacturer to upgrade the onboard software when the car is well connected to the manufacturer's server using a reliable 5G network. Similarly, to add new features / applications to the car when desired, the manufacturer or the car can initiate a software download or enable online transactions using the 5G connection. The car manufacturer can collect data from the car telemetry units and use that information to alert consumers about preventive measures. They can also aggregate this information from multiple cars to arrive at certain patterns that can help improve the overall consumer experience.

When the car is taken to the service centre for maintenance, the 5G connection there comes into play for reading diagnostics data, uploading and downloading new software versions.

What's more with a connected car and 5G

The next level of advancement has to do with Cellular Vehicle to Anything connectivity (C-V2X). This technology uses a 5G network to connect a car to nearby street infrastructure such as traffic lights, blind spot warnings etc., with other cars on the road to exchange traffic information, and with the devices of pedestrians as well. This will hopefully lead to safer and more secure road travel. This is not limited only to passenger cars but extends to other road mobility systems as well. Extended further, this can be the starting point for means of integrated multi-modal surface transport in a city. A reliable and secure 5G connection becomes the foundation on which these services are enabled.

In conclusion, a dependable and secure 5G network is an enabler for the digitalization and personalization of vehicles. In future hyper personalized cars and C-V2X technology will become a reality, enabled by underlying private and public 5G networks.

Tata Communications is already working with enterprises and automotive OEMs to embed 5G connectivity to enable a vehicle to be born-connected. We are helping companies to build private 5G networks, to enable factory automation and in-factory OTA updates. If you are interested to learn more about this topic you can reach out to the author, to discuss connected car technology, the deployment of Private 5G and how you can benefit from this technology.❏

AUTHOR

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Viswanathan Ramaswamy, commonly known as 'Vishy', is a telecom industry leader with over 31/2 decades of experience in the communications industry. He has a vast knowledge about various networking technologies and the associated IT solutions. He has been a thought leader in the areas of technology convergence and industry application of mobile network technologies. He is currently the Vice President for 5G and Digital Solutions Incubation in Tata Communications. Prior to this he has worked with companies like Wipro, Vodafone India, AT&T and Crompton Greaves Ltd.

Telematics, a Crucial Gateway for Tomorrow's Software-Defined Vehicles

In an interaction, Dr. N. Saravanan, Chief Technology Officer, Ashok Leyland, shared his views with Richa Tyagi during 62nd SIAM Annual Convention 2022 at New Delhi. Dr. Saravanan, before joining Ashok Leyland, was associated with Ford Motor Company and Intel Corporation. Here are some excerpts from the interview:

Could you please tell us about the new initiatives at Ashok Leyland to meet the transition in automotive industry?

To meet the transitions in automotive industry Ashok Leyland has taken some initiatives particularly in powertrain and fuel system. Electrification is already there in some segments including commercial vehicles and the buses. We are looking at electrification in the light commercial vehicles and migrating towards heavier trucks. The next technology we are looking at is CNG and LNG. CNG had a spike last year but because of pricing it has come down but we expect it to stabilize. After that we will look into green hydrogen or any form of hydrogen burning IC engine.

The other set of technological changes are in the area of connected vehicles and software driven vehicle. When we talk about connected vehicles, it is not necessarily autonomous driving but more about the use of automotive telematics. Our focus here is to use this technology to make things safer, while increasing the economics from a customer perspective.

Can you tell us about the Digital NXT platform?

We believe in the long term, 'digital' is the key. Whether it is in the design phase, manufacturing phase or even in sales process. We're looking at how we transform from a digital perspective. The lowest level is automating, which is traditional. The next is how to use 'digital' to get things done faster and better. How to, increase efficiency in the plant, how to improve sales performance and so on. The long-term goal is to have things like 'digital showroom'. The idea is that in long term 'Digital' becomes the fabric in Ashok Leyland.

Can you share your views about total cost of ownership?

If you look at new products it is all going to be based on total cost of ownership. It is not just about buying the vehicle. Even if you look at the EV buses you find customers say 'I'll pay per kilometre' which means you need to have a good total cost of ownership. What digital does, for example even if you're selling electric buses, we call it a mobility service platform. We are not selling products. We are selling service. So the more 'digital' you are able to use, the more efficient you are, that is how we can reduce costs. By using digital, we are able to see and govern every aspect. We are able to use 'digital' as a way to decrease overall TCO for the customer.

DR. N. SARAVANAN
CHIEF TECHNOLOGY OFFICER
ASHOK LEYLAND

Is there any role of telematics service providers around your ecosystem?

As you may be aware starting with BSVI, every vehicle we sell has a telematics unit. We are in the Gen One of telematics where we are doing a bit of trace and track, we are trying to improve fuel economy; we are doing a bit of a driver monitoring etc. I think in long term vehicle telematics becomes the hub, when It becomes a central gateway for us to not just interact with the vehicle and customers, but being able to use that as a gateway for software driven vehicle.

Thinking of electric vehicle, no one can stop me from giving you more range, less range. The software is giving me more power or less power depending on the application and so on. In tomorrow's vehicle which would be a software defined vehicle, I think telematics will be a crucial gateway.

Anything on Driver Behavior Monitoring?

Driver behaviour monitoring which helps in both ways one is from preventing accidents or safety perspective which is very critical for us; and secondly it is optimising fuel consumption, which is one of the large cost for customers. Especially with new technology like battery electric vehicle, 15-20% of the economy comes from a driver behaviour. We can train driver by using telematics data in a vehicle. Gaming or simulation platforms can also be used to train drivers. I think we can see lot of benefits.

We introduced a couple of products in the market, which are in pilot stage. The idea is how do I improve driving behavior both from fuel economy and also from the safety persepctive.

SCALAR - Orchestration Platform for Fleet Operators in India

Telematics Wire is in discussion with Hjalmar Van Raemdonck, Head of Digital Systems Solutions, Commercial Vehicle Solutions Division, ZF Group Here are the excerpts:

HJALMAR VAN RAEMDONCK
HEAD OF DIGITAL SYSTEMS SOLUTIONS
COMMERCIAL VEHICLE SOLUTIONS DIVISION, ZF GROUP

ZF recently launched its SCALAR Fleet Orchestration Platform - please can you elaborate about what SCALAR is?

SCALAR is ZF's new Fleet Orchestration Platform which offers fleets real-time, AI-based automated decision-making, optimization and advanced operational efficiency. It brings together the four core principles of transportation – what to transport, how to transport it, when it should arrive and ways to improve - by combining Planning, Routing, Dispatching and Business Intelligence capabilities in a single dynamic and open platform. This ensures any changes are automatically applied throughout the chain.

Establishing intelligent end-to-end systems, SCALAR can seamlessly 'orchestrate' freight logistics and passenger transportation. Setting a new industry benchmark, SCALAR brings together advanced digital connectivity and supports future technologies, including autonomous driving, for mixed fleets.

Leveraging the powerful digital capabilities of SCALAR's Fleet Orchestration Platform will enable ZF to virtually redefine Fleet Management and help commercial fleets achieve new levels of efficiency by establishing intelligent end-to-end systems.

How will the commercial vehicle industry benefit from ZF's Scalar and can you share any use-case benefits?

With approximately 25 to 40 percent of freight journeys estimated to be empty runs, Orchestration has the potential to help improve fleet efficiency by sending the right vehicle to the right place at the right time. This includes selecting the most fuel-efficient and less

environmentally impactful route, supporting fleet sustainability and reducing the Total Cost of Ownership (TCO) in a fully automated way. SCALAR can also aggregate loads to provide optimal cargo loading for each vehicle.

Automation, self-learning and dynamism are the key elements that set "Orchestration" apart from conventional "Fleet Management". SCALAR also brings the industry's first holistic mobility orchestration portfolio to set the stage for 'Next Generation Mobility' with Autonomous, Connected and Electrified (ACE) vehicles.

Orchestration generates greater value than combining individual isolated digital solutions through active integration, automation and self-learning. Planning, routing, dispatching and business intelligence are actively integrated and optimized with AI to deliver significant benefits. This includes eliminating management by exception and human error margins as well as ensuring live adaptation and re-optimization to fully automate fleet operations.

SCALAR also provides a wide range of technological benefits to support operational efficiency, sustainability and vehicle uptimes. During its recent Global Technology Days at its test track in Jeversen, Germany, ZF showcased two key proof-of-concepts to demonstrate SCALAR's future capabilities. This included supporting driver safety as a result of advanced processing of data from a vehicle's ADAS systems. Additionally, by processing data from cargo monitoring sensors, such as CargoCam, SCALAR has the future potential to provide better protection and management of trailer payloads.

What are the key elements that distinguish ZF's Scalar from the other commercial vehicle Fleet Management Solutions, who are your competitors and how does it compare with their solutions?

Leveraging its position as the largest global vehicle technology supplier to the commercial vehicle industry, ZF can access rich and unique proprietary vehicle data from its comprehensive portfolio of IoT/connectivity devices. ZF has also acquired Bestmile's world-class optimization technology for autonomous vehicles and passenger cars. This has further enriched ZF's extensive Fleet Management System expertise with capabilities for forecasting, self-learning and live automated decision-making for fleets. ZF has now built an open, modular and dynamic platform to bring all these capabilities together. Fully automating fleet processes in real-time, ZF's SCALAR ensures fleets can automatically send the right mission to the right vehicle at the right time.

The integration of Bestmile's Orchestration solution represents both a technology enabler as well as a significant commercial milestone for SCALAR in preparing the ground and delivering orchestration

services. Underpinning ZF's strategy to realize Mobility-as-a-Service (MaaS), ZF is already successfully commercializing the Mobility Service Orchestration Solution, enabling public and private mobility providers to plan, launch and operate highly efficient fixed-route and demand-responsive transportation services for passengers.

When are you going to launch ZF SCALAR in India and as Indian customers are driven by costs, do you plan to introduce a customized solution for the Indian market?

We have a very good understanding of the market requirements for India and fleet orchestration is the next logical step in the value chain after Fleet Management solutions. Our Global Development Centers in Bengaluru and Chennai are at the forefront of rolling out SCALAR solutions for global and Indian markets. Prior to a full launch for the region, the solution is being customized to fully meet the needs of Indian customers. Over 100,000 vehicles have already been equipped with ZF's solutions in India. Leveraging this rich data, provides ZF with a deep understanding of the complexities and specific needs of the Indian transportation market.

ZF Commercial Vehicle Solutions (ZF CVS) India, is the preferred partner for leading CV OEMs seeking the latest hardware and value-added services because it enables them to be leading players in the market with fully connected vehicles. In the aftermarket, we are the preferred white label partner for a leading international player and supply our hardware and data services.

The pillar of any modern fleet operation is its Fleet Management System as it provides connectivity devices to digitalize vehicle information and a set of digital tools to allow fleets to run safely, greener and more efficiently. India is a growing market and there are several fleets that are already using advanced Fleet Management Solutions. Global operators have made this part of their fleet mandate as TCO, driver comfort, vehicle safety and efficiency and customer satisfaction are major drivers. Large and medium Indian fleets are also adopting ZF's Aftermarket solutions for their fleets as our value-added offering, from hardware to software and data services, is a key differentiator.

How do you see telematics and connectivity evolving in the India market and how will SCALAR – is it ahead of it time or a catalyst for telematics adoption in India?

India's commercial vehicle market is fast growing and, with increasing fuel costs, driver retention and pressure on cost margins, connectivity solutions will have a greater role to play. Global markets across Europe, Americas and APAC have also reached a stage of maturity for fleet connectivity.

India has only scratched the surface of this potential and many small and medium fleets are yet to realize the significant benefits that connectivity solutions can provide. OEMs are now offering connectivity solutions as a part of their standard package. The Indian CV market is expected to grow at 15% CAGR over the next 5 years. With the increasing complexity of supply chains for freight and passenger transportation, FMS systems must connect and interface with a growing number of other systems.

ZF's CVS division is a long-standing pioneer and market leader in fleet telematics globally and across India. As a leading global player ZF sees a strong potential in the Indian market. Going forward, it is ZF's belief that a fundamental shift is needed to advance from the industry's current 'silo' operating patterns to better address the challenges faced by fleets today. With the introduction of ZF SCALAR, we'll be the first mover in the commercial vehicle segment to introduce a fleet orchestration platform.

Do you work directly with CV OEMs and Fleets globally and in India or through partners; how does ZF support its partnerships and what additional value they bring and how do you leverage third party / business partnerships?

Globally we connect all parties in the value chain via our proprietary

solutions and partnerships. For example, in Europe we collaborate with Goodyear to provide integrated Fleet and Tyre Management Solution supporting mixed and multi-brand cargo fleets and trailer manufacturers. Through Transics, we work with several Transport Management System partners globally and will continue to leverage these partnerships in future.

In India, we work directly with OEMs and with fleets while also working through our channel partners to market our solutions. Depending on fleet requirements, we have multiple business models with our channel partners to offer these solutions. We have over 250 customer touch points through our dealer, distributor and services network across India enabling close customer proximity. We also recently launched the sales, services and spares concept aimed at developing fleet uptime centers that will support our connectivity solutions.

With the launch of SCALAR, leveraging business partnerships and value-added resellers will be important in enhancing reach and to offer customized solutions that meet fleet requirements. We anticipate that the requirements of each fleet will be different, and with ZF providing its orchestration platform, our business partners will be our customer face.

With telematics and connectivity solutions significant vehicle data is captured - how do you support customers with insights from this data and who owns it?

ZF enables rich vehicle data to be securely captured and processed to help support fleets with actionable insights that help drive a whole host of efficiency benefits from enhancing vehicle uptimes to lowering fuel costs, emissions and the Total Cost of Ownership. At every stage, customers own their data. They are free to use their data in any way they wish and can also give ZF the right to use the data to help us create better services.

How do you see the evolution semi-autonomous or autonomous vehicles in the transport industry globally and the impact for India in the medium and long term?

The commercial vehicle industry is facing unprecedented challenges including safety improvement, driver cost and availability, reducing emissions, driving operational efficiencies. Autonomous driving and vehicle automation has a powerful role to play, now and in the future, helping deliver safer, more efficient vehicles and fleet operations. The automation market is diverse, ranging from simple closed yards to urban and last mile operations. ZF is uniquely positioned to provide OEMs and new players with tailored solutions from yard operations to trucks, fleet management and fleet orchestration. As a complete-vehicle-automation system solutions provider, ZF is the preferred partner for OEMs and operators of autonomous transport and mobility services globally. ZF is building on its strengths with ecosystem technologies that enable us to provide customers with timely, proven and cost-effective tailored Automation Solutions from vehicle to service level.

India is fast catching up with the global players. Vehicle automation ranges from from Level 1 vehicles, where full control by the driver is supported by individual assistance systems, up to Level 5 automated vehicles which are fully autonomous. The autonomous vehicle market is now gaining ground with high-end passenger vehicles entering the arena with varied levels of automation. ZF CVS India in partnership with TATA Motors was the first in the industry to launch the forward collision warning system and lane departure warning system on commercial vehicles in 2018. We are continuing to work on advanced levels of automation with road safety, driver retention and TCO demands accelerating the roadmap for autonomous driving.

Comparing last mile goods delivery with long distance goods transport, which segments are currently gaining greater traction with digital solutions?

ZF provides connectivity solutions across the board, from passenger cars to all categories of commercial vehicles. This includes solutions that cover the entire logistics and transportation value chain ranging from first to last mile. Long distance goods transportation, in particular, can benefit from an extensive range of digital solutions. Irrespective of the distance or form of transportation used, however, connectivity will play an increasingly powerful role in the transportation eco-system.

Fleets are operating in a highly challenging and complex environment, with rising fuel costs, regulatory challenges, skilled driver shortages and drive for cleaner, greener and more sustainable operations. It is now an operational reality that fleets in India are increasingly realizing that with fleet management solutions they can gain real-time insights to their operations. As a result, they are being supported with effective route management, vehicle utilization, driver behavior analysis, fuel use tracking and a great deal more across the supply chain and beyond.

How will you retain customers and extend their platform subscriptions given the high second year drop off rate under the subscription model, particularly in the Indian market where OEMs offer it as a year one package?

While this is a challenge currently faced by many OEMs and other suppliers in India, ZF's extensive aftermarket network / channels reach enables us to bundle and provide value-added solutions for specific segments. This helps us to sustain and grow subscription levels.

As Head of Digital Solutions, what's your short and long-term business vision?

Our goal is to bring connectivity to a whole new level to create and enhance services as well as to increase the efficiency of people mobility and freight logistics. We anticipate that future fleets will be increasingly automated, connected and electrified, so fleet operators will need innovative solutions to address this challenge. ZF's aim is to make fleets leaner, greener, safer and more efficient. On top of this we continue to strive to make fleets faster, more transparent, regulatory compliant and more sustainable. As the complexity of fleet operations increases, we aim to help them make the right decisions quickly and in the most efficient way. Undoubtedly, we will be the India's preferred choice of digital solutions partner for connected vehicles.

5G, The world of Possibilities

🖊 **SANJAY KUMAR**
Skill Lync

Gearing up

We just concluded the 5G Spectrum Auction in India and 5G rollouts in India are around the corner. So, we may get some natural questions on what 5G brings to the table and how it is different from previous generations, what new use cases it enables, and how retail customers, Enterprise customers, and Mobile Network Operators are going to get benefitted out it.

5G is not new to the world and has been available in some countries for a while and learnings from those networks are going to help India deploy better networks.

A lot of new telecoms, IT/ITES, and Startup companies are entering into this space and this 5G space is buzzing with a lot of excitement.

In this article, we will try to understand what the current status of 5G Rollouts in India is, what makes 5G so exciting, what new use cases it is going to enable, what new capabilities users can expect and what business opportunities it is going to bring to the companies.

Spectrum Auction

This was one of the biggest spectrum auctions and the total bid amount 1.5 Lac Crores INR. The total spectrum on offer was 72 GHz and 71% i.e. 51.2 GHz was sold. The three major bidders were leading private MNOs of India i.e. Reliance Jio, Bharti Airtel, and Vodafone Idea.

Adani Group was a surprise entry, but it bid only for a very small chunk of spectrum for Private Network use only. The below data suggests the major spectrum buys for all these players.

- Jio has acquired a 24,740 MHz spectrum at a price of 88078 Cr INR
- Airtel has acquired a 19,868 MHz spectrum at a price of 43084 Cr INR
- Vodafone Idea Limited has acquired a 6,228 MHz spectrum at a price of 18799 Cr INR
- Adani Group has acquired 400 MHz spectrum at a price of 212 Cr INR

However, Jio was the only company that acquired a 700 MHz band spectrum in all 22 circles. This is considered a very important decision as 700 MHz can give much higher coverage compared to other bands which were available for buying. This is one step that can help Jio to acquire 2G customers of Airtel and Vodafone.

Way forward

By looking at the outcomes of the spectrum auction, Jio looks like a clear winner followed by Airtel. However, it may not be easy as it looks. Vodafone Idea is still struggling with cash flows and may take some time to become relevant in this game. Adani group has still not opened all its cards and we should be ready for some more

surprises coming from Adani Group.

Both Jio and Airtel are rushing for early rollouts and new announcements are made every week. Both are getting into a lot of strategic partnerships to build the ecosystem around 5G, be it Jio Partnering with Google for budget phones or Airtel partnering with IBM and Red Hat for building secure Clouds.

Undoubtedly, 5G offers multiple times higher speeds and lower latencies compared to 4G and it has started enabling some interesting use-cases globally that are changing the lives of millions of people and building new revenue streams for Mobile Network operators.

It comes with a lot of features like Software controlled networks, Logical sectioning of networks referred to as Network Slicing, and distributed cloud infrastructure referred to as Multi-Access Edge computing (MEC).

In addition to these, we have new promises of Private networks, Open and Secure Networks, Network Exposure for third-party access, and interworking with most of the other technologies like 4G, WiFi, Wireline, etc. However, there is limited backward compatibility with 2G and 3G networks to help Mobile Network Operators to scrap those networks gradually.

One of the important aspects of 5G technology is to introduce several new bands of frequency spectrum suitable for wireless mobile communication from low bands to mid bands to higher bands. The radio spectrum is a precious resource and 5G is trying to make use of these spectrums in the best way possible. Licensed spectrum is a precious resource, so more and more efforts are being done for building new capabilities around unlicensed bands as well as higher bands called millimeter waves.

We may wonder what the benefits of 5G could be unless we have new applications that will need these higher speeds and lower latencies that 5G has to offer. As we are unlocking the possibilities of 5G, let's understand why 5G is a promising thing for India Inc. -

More opportunities for Indian IT Companies

India was already a superpower in the Software industry for a decade, accounting for more software exports than oil imports. However, when it comes to Telecom technologies, we were one of the last few countries to adopt new technologies because of price-sensitive markets. In fact, we never contributed much to the global telecom standards landscape except by contributing in the background and building some Network Operations Centers for managing global networks.

However, with the software-centric networks and Cloud play, India is becoming the epicenter of Telecom technology discussions and more and more companies setting up their base and building their engineering teams in India, is going to change how India contributes to the world of Telecom. Some new initiatives like Production Linked Incentive Scheme (PLI) for Large Scale Electronics Manufacturing and the Semiconductor manufacturing push are some of the things which are going to give India a bigger opportunity.

Need for Speed

India is already the highest data-consuming country in the world, and it is going to grow further. Content consumption is increasing day by day and more and more vernacular content is fueling its growth. The average Mobile monthly data consumed per user In India is 17 GB, which grew 50% In the last 5 years, and it is expected to touch 40-50 GB per month by 2025. This growth mainly comes from more video consumption and the popularity of social media on the go. Even the video quality is changing from Standard Definition (SD) to High Definition (HD) and beyond. India has a massive rural and semi-urban population which was untouched in the previous generation (2G/3G) networks that got connected to the internet with 4G and is expected to grow further with 5G.

Recent growth in EdTech because of covid has given further growth to Mobile Networks Operators. For example, the current K-12 school system in India is one of the largest in the world with more than 1.4 million schools with 250+ million students enrolled who are now getting connected to the world of the internet.

Let's Play

Mobile gaming or Online gaming getting very popular in India and more people are using these kinds of applications. Augmented Reality, Virtual reality is giving an immersive experience to these users while using these gaming applications.

As per the report of KPMG, India is expected to become one of the world's leading markets in the gaming industry. Growing steadily for the last five years, it is expected to treble in value and reach $3.9 billion by 2025. The total number of online gamers grew 8% from 360 million in 2020 to 390 million in 2021.

5G Spectrum Auction

■ Spectrum Bought (in MHz) ■ Amount Paid (in Cr INR)

Need for Speed
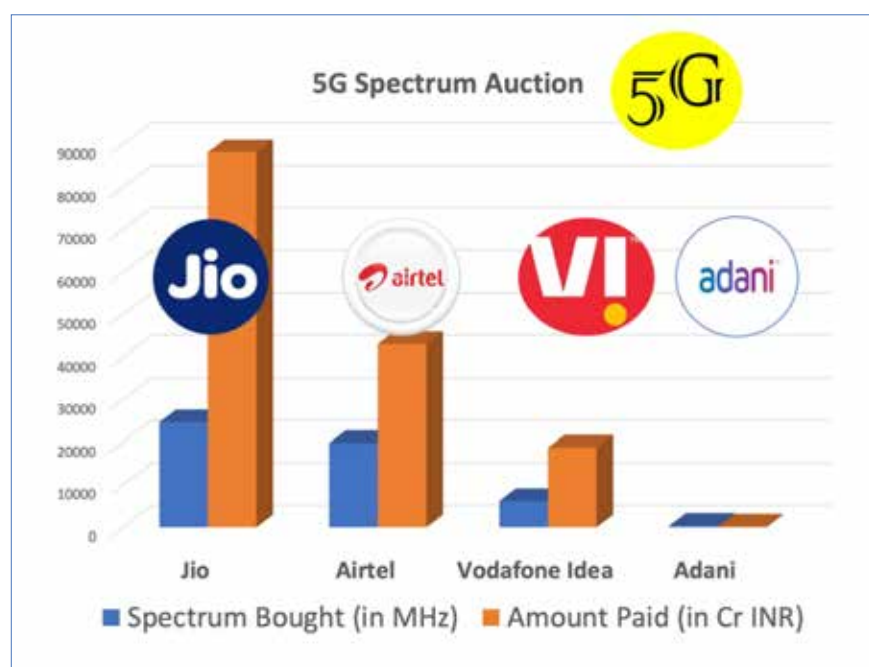
OTT (Over-The-Top) applications dominate all other modes of communications

Telecom networks are transforming into service networks compared to just providing connectivity to users. For example, Jio has a big bouquet of services which includes Instant messaging, Video, Movies, Books, News, Music, and what not. Airtel is also working in a similar direction either with some in-house expertise or some strategic partnerships. They are also collaborating with companies like Netflix, Prime Video, etc to give a better experience to their users. Many of these services are bundled with their prepaid or postpaid plans.

5G Private Networks

With a lot of these new requirements from new use cases of 5G networks, achieving diverse performance requirements may not be possible in public networks. So, there is a lot of traction for deploying many of these use cases in private networks referred to as Private 5G or NPN (Non-Public Networks). These private networks can be completely isolated from public 5G Networks and can be integrated with Public Networks. Even Networks Slices can be used as a private network in some scenarios. China has already deployed more than 5000 private networks.

5G auction in India has already given licenses for deploying Private or Captive Networks and we may see a lot of Private networks being built in India as well.

Industry 4.0

Networks till 4G were mainly targeted towards the end user for providing Broadband data rates to them. However, that remains one of the focus areas by providing much higher network peak data rates of 20 Gbps in 5G compared to 1 Gbps in 4G Networks, there is a lot of work is done on connecting devices, industries, and enterprises. With the introduction of some new service verticals in 5G like mMTC (Massive Machine Type Communication) which connected millions of devices, uRLLC (Ultra-reliable Low Latency Communication) which gives very reliable and fast networks, and V2X (Vehicle to Everything) to connect millions of vehicles, 5G takes a leap on the services offered by 4G Networks. Specifically, mMTC and uRLLC are going to change the way how cities and factories are imagined where devices, machines, and robots work in a closely connected environment and operate autonomously.

Smart factories will have the ability to manage production and allow companies to optimize the resources used and improve the quality of products.

Summary

In this article, we have looked at the big picture of the possibilities which are unlocked by 5G without getting too many technical details. We may see full fledge 5G networks in India and Reliance Jio and Bharti Airtel will be front ending this. These networks are going to be massive networks in the world and will set up some examples of how to build networks of this scale.

At the same time, 5G brings a lot of new opportunities to Users, Enterprises, and Mobile Network Operators.

Exciting times ahead!!

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Flexibility of Connectivity with eSIM in Telematics

✎ **SACHIN ARORA & VISHWAKANT MOHAPATRA**
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Telematics as per Wikipedia is an interdisciplinary field encompassing telecommunications, road transport technologies (road transport, road safety, etc.), electrical engineering (sensors, instrumentation, wireless communications, etc.), and computer science (multimedia, Internet, etc.). Telematics can involve any of the following:

• The technology of sending, receiving, and storing information using telecommunication devices to control remote objects

• The integrated use of telecommunications and informatics for application in vehicles and to control vehicles on the move

• (Most narrowly) The use of such systems within road vehicles (also called vehicle telematics)

There was the time when Indian telematic market was very fragmented and there was no mechanism and no specification to regularise or standardised the products of telematics in the market. To address the concern Automotive Research Association of India (ARAI) introduced the specification for the Indian telematic industry. As a start the focus was on commercial vehicles to enhance the safety and security of the end users/passengers.

The release of the AIS140 specifications brought a paradigm shift in the industry to standardised all telematic devices to have common functionality across various manufactures. With the roll out of the specifications the concept of the connected vehicles started prevailing in the Indian automotive industry where the telematic box is able to capture, communicate the relevant data to the respective systems for better functioning, safety, security of the vehicle and the users.

Connected cars has always been one of the major contributor of the large IoT market and has set a bench mark for the other industry use cases where the ability of M2M segment is getting reflected in the operational effectiveness. There are many ways by which telematics can benefit to the world of connected vehicle:

Service and predictive maintenance: which is accessing the vehicle health statics and data. Predictive maintenance is utmost importance for smooth running of the vehicle.

Productivity: Various parameters can be defied to track driving time, fuel utilization etc.

Safety: Driving behaviour like speeding, cornering, hard braking etc are basic parameters to consider for safety.

Navigation: Providing maps and turn by turn assistance.

Remote Security: A mechanism to provide and manage remote locking and unlocking of vehicle in adverse case of theft.

There are two segments we all are talking about when it comes to connectivity, one is consumer electronics segment and the next big segment we all talk about is Internet of Thing's i.e. primarily connecting all devices to create a way to talk and communicate with each other. There are various industries which can utilize and leverage Internet of Things for their industry specific use cases example transportation. When talking about transportation, we all know how dependent we are on transport services in our day to day lives.

The primary concept is to have an ability of identifying any irregularities much ahead of human ability to detect and notify to the right entity at right time. One of the components of 'IoT' in automotive is vehicle telematics which is real and evolving very fast and bringing the real information at real time. Telematics devices are aiming in not only helping in vehicle tracking but also to enterprises to capture, study data and plan strategies.

Telematics devices from a technology point would then require two technical aspects, one is Global Positioning Satellite (GPS) to track vehicle position, status and also a big way to provide a peace of mind to owners as well as fleet and logistic service providers. Second key aspect is in term of mobility connectivity to capture vehicle real time service status and update the end manufacturer to ensure real time data collection to identify malfunctions, service due notification and also remote access of vehicle in terms of an accident.

When it comes to global mobility connectivity, cellular connectivity is the priority and preferred medium of connectivity as it offers security, reliability and scalability for small to large IoT systems.

With e-Vehicle picking up in market it is really becoming a need to have a telematics

device with seamless connectivity, what we need is a more efficient and economical means of separating vehicle manufacturer data from user specific data need.

Another use of having telematic is to bring in the flexibility of making and providing insurance premium incentives, as in India we have two-wheelers, three-wheelers, passenger cars and commercial vehicles. Such option can actually help insurance companies to actually offer discounts to vehicle owners. Infact Insurance Regulatory and Development Authority of India (IRDAI) has already endorsed telematics as a way for drivers to save money while staying safe and becoming more aware of their surroundings. Such data can also help in analysis of real-life driving behavior, driving patterns, live alerts and warnings that can be produced in case of any violation of safe driving practices which again can be made available to local Transport office that can be used to issue challans or even a criteria in renewals of driving licenses a step to reduce accidents on the road.

Advancement in the technology comes with different aspects that need to be considered with due diligence before the commercialization. Overall in IoT there are two critical parameters in the end to end supply chain which are Data, Security and Connectivity. When it comes to any form of data exchange between device and a backend system one always need to ensure that the data that are exchanged need to be highly secured and secondly there need to be a seamless connectivity that is available in terms of internet between the telematic and the backend server. As telematic data need to be secured because of its sensitivity we need to ensure the required encryption algorithms, firewalls, security should be taken care with at most priority.

Coming on to connectivity, it's another critical aspect that needs to be considered. To ensure seamless connectivity we should go for a robust mechanism of including eSIM into the telematic arena. Why eSIM? Today telematic box comes with one Java plastic plugin SIM card with only one operator subscription making it bounded to the same operator through its life cycle. In such a scenario in case the end consumer denies to renew the subscription either the vehicle manufacturer has to bear the cost of annual subscription or the end consumer is debarred of the services. To address these

genuine concerns the eSIM will be the future of connectivity.

GSMA offers the concept of having multiple network operator profile available on a single eSIM. With eSIM there is no dependency on a single operator solution and user can opt to go with any of their preferred subscription and this shall also make vehicle export as well as import to have local country specific subscription meeting the local regulatory norms. eSIM not only removes the single operator constraints but at the same time since it s soldered directly on to the telematic PCB shall ensure that it is always intact to the system with no possibility of any type of non-contactable scenarios such as dust or rust which is a major concern for market situation of India. It also offers highest level of security by eliminating any possible tampering of the technology by end user or even local automobile garage mechanics.

To address market requirement there are various eSIM grades defined based on their operating temperature limits. In general eSIM for automotive always refers to AEC-Q100 certified SIM card, however for the specific use case of telematic devices which are normally installed within vehicle passenger compartment an eSIM with temperature range from -40°C to +85°C can also be used.

With the technology advancement and readiness of 5G launch by Indian telecom operators a whole new world of faster connectivity, low latency and higher bandwidth will be opened to roll

out innovative new use cases. Faster connectivity will give a major boom to the telematic industry to have much faster real time data transmission and opportunity to act on the required actions post evaluation of the collected data.

With higher bandwidth as more and more vehicle in India will have telematic enabled, so the possibility of network bottleneck shall be completely ruled out. At the same time low latency shall allow various back end system to process high volumes of fast-moving data generated from various telematic units.

Indeed, combined in an optimal way, telematics will increase driving safety and at the same time would make vehicle owners, increase driving confidence and at the same time provide a mechanism for vehicle owners. Overall telematics is a need for market like India but there is a need to have and adapt to a more secure and scalable solution that is meant to meet Indian consumer demands and sentiments. With the growing global visibility of eSIM industry expect to offer much reliable telematic with eSIM's which can be independent of one specific operator and adding other benefits like security we see a demand and push of telematics specially in automotive segment.

As various telematic manufacturer are planning to launch their devices in the market we foresee that eSIM technology based devices shall stand out to be a clear winner due to their highlighted core advantages. ❑

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What 5G connectivity means for the Automotive Industry

✎ **UDIPTYA PAL & ALOK SINGH**
Teradata

Introduction

We are witnessing a distinct shift in the Automotive industry from linear value chains with OEMs at the end of the assembly line to a networked ecosystem with multiple players collaborating and interacting with each other as well as the end consumer. As a testament to that trend, this article on the impact of 5G in Automotive industry is an outcome of collaboration between Teradata industry leads from two industries - Automotive and Telecommunications.

As the 5G network is getting rolled out in India, there are huge expectations from the industry, especially the Automotive industry. The automotive industry and the mobility ecosystem together can potentially gain quantum benefits by effectively using the 5G connectivity technology.

What is 5G?

5G is now being rolled out in India. For consumers such as you and me, it provides significantly faster speeds and access to more responsive applications for 'enhanced' broadband experience' when we compare with existing 4G experience. But that is not all, 5G is not 'just a fat and faster data pipe', instead, it's a purpose-built technology that provides 'Ultra Reliable & Low Latency' coupled with 'Massive Machine Type' connections.

Because of these inherent capabilities, 5G is rightly said to facilitate and accelerate next industrial revolution of Industry 4.0. The inherent characteristics of the 5G connectivity also makes hyper connected mobility solutions a real possibility. Automotive and Transportation sector would be a beneficiary of this Telecommunication driven technology advancement along-with various other

sectors such as health, smart-city, manufacturing et-al.

5G Impact on Mobility ecosystem

Today, we have millions of vehicles which connect to cellular networks for navigation, connected infotainment, emergency services etc. But the new cellular network, like 5G, will enable additional applications due to increased throughput, higher reliability, and low latency.

The use cases can be broadly classified into three categories in the connected vehicle space:
- Safety related use cases
- Infotainment related use cases
- Efficiency related use cases

The 5G network can commercially enable what we call C-V2X connectivity, which stands for Cellular Vehicle-to-

Everything connectivity. Here Everything can be another vehicle, pedestrian, road and traffic infrastructure, network etc.

Safety related use cases: India holds the infamous distinction of having the highest road fatalities globally. Hence, road safety applications of 5G would be of paramount importance in Indian context. Some of the relevant use cases are mentioned below.
- Alerts: Turn assist in non-line-of-sight (NLOS) scenarios, emergency braking warning, collision avoidance/crash warning etc.
- Speed control/recommendations: Speed adjustments due to road closure / accidents / congestions ahead to avoid pile ups or collisions. Traffic authorities in Australia are exploring using 5G to maintain safety and yet reduce inter-vehicle distance in tunnels to avoid congestion and crashes
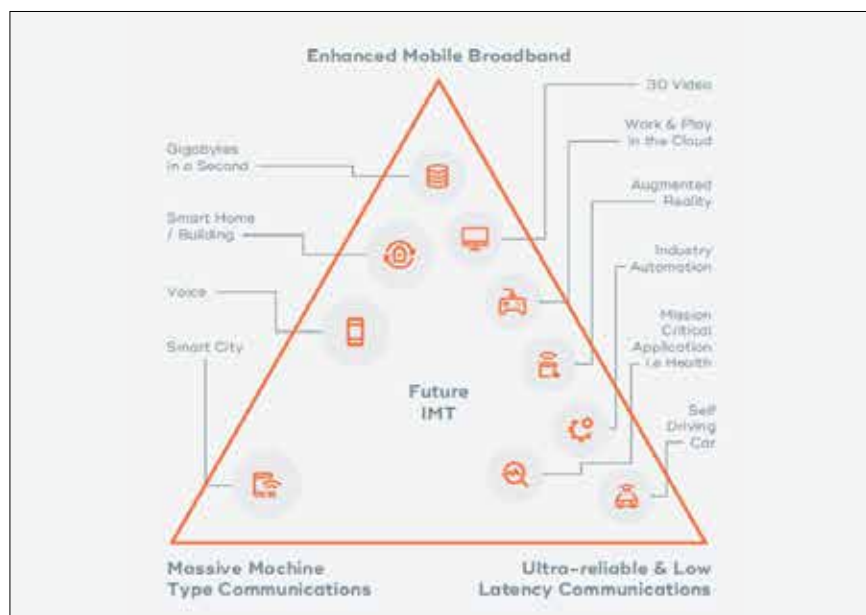
5G Application Use Cases/drivers (courtesy – Teradata)

- Intersection Management: Improved coordination of intersections making them safer

Infotainment related use cases: This is an area which is going to exponentially grow due to the 5G bandwidth capability. This is also a potential area for data monetization for the mobility ecosystem players. Some of the use cases are mentioned below.

- Streaming media and Gaming: Rich HD media can be streamed directly to the infotainment system over the 5G network. High-end online gaming could also be supported by the network.
- OTA updates: It will become easier for vehicle manufacturers now to send large software updates over the cellular network, for various reasons like bug fixing, adding functionalities, infotainment etc.
- Mapping: 5G will enable more accurate real time map updates in 3D as well. This will also enable providers to monetise by allowing location based services in the vehicle.

Efficiency related use cases: This is an area which is primarily useful for fleet and commercial vehicles. The characteristics of the 5G network can be intelligently used to deliver value to the commercial and fleet customers. Some use cases are mentioned below.

- Platooning: Platooning is a concept of commercial vehicles (trucks) driving in tandem at a coordinated speed, maintaining a specific distance between each, thereby reducing fuel consumption hence cost as well as CO_2 emissions. This is enabled by real-time high-speed communication between the trucks.
- Route optimization: Real time traffic and map data can enable vehicles to optimize routes for faster trip hence lower cost per km travelled.

5G Impact on Automotive Manufacturing

Another area which is often neglected is the impact of 5G private networks in manufacturing. Rolling out of 5G network in India will be a huge accelerator to the adoption of Industry 4.0 in manufacturing sector like Automotive. With Operators offering private 5G networks for enterprises, the high volume, low latency, high reliability of 5G technology will perfectly suit the connectivity needs of Industry 4.0 use cases. This will make many potential use cases like streaming video data analytics possible for visual defect identification or plant safety.

A very practical use case is flexibility of placing robots in the factory floor, as you don't need to worry about the wired network cables, only power source will be needed (Audi and Ericsson have successfully completed a pilot on this). This means that the production setup can easily be changed, and units moved around on a day-to-day basis to maximize efficiency. With a private 5G network, factories can roll out AI (Artificial Intelligence) and machine learning quickly, without needing to disrupt the production line and supply chain through changes to infrastructure. That means manufacturers can meet customer demand of more customized products. This is vital, as most studies point to an increasing demand for customized vehicles on B2C buying channels.

Conclusion

As we see more and more technology disrupting the automotive industry, it presents a major opportunity for the global tech giants to disrupt yet another industry. They have already made inroads in the form of infotainment platforms, and there are major ongoing investments from these players on other aspects of the automotive ecosystem. The smaller tech startups are also well suited to take advantage of the massive amount of data which is getting generated from the automotive ecosystem.

This has made it imperative for the traditional Automotive OEMs to move to become technology-driven organisations at a faster pace.

There is also going to be a huge investment required in network performance to enhance the service quality to serve the automotive ecosystem. This may need the forming of an ecosystem to unlock value pool. We might also see an increase in public–private partnerships to address some of these issues by co-investing with both telecom operators and automakers to build the necessary network infrastructure.

Globally, a substantial number of Automotive and Telecom companies have come together to form a consortium called 5GAA to bridge the automotive and telecommunications industries for defining the next generation of connected mobility, automated vehicle, and intelligent transport solutions based on C-V2X. We need a similar initiative in India to define India specific solutions.

The telecom industry, automotive industry and the mobility ecosystem at large have grand expectations from the rollout of 5G in India. It will need a lot of stakeholders to come together to make it happen.

Disclaimer: The views, thoughts, and opinions expressed in the article are done solely by the authors in their personal capacity, and do not necessarily represent those of the authors' employer, organization, committee or other group or individual. ❑

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Sensor Fusion for Autonomous Vehicle

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Autonomous vehicle is one of the trending research topics, it will revolutionize the future of ground vehicle. Autonomous vehicles are replacing the ordinary vehicle as it can make decision and perform driving task of their own. Every year 1.3 million of people die due to accidents on road, i.e., 3700 people per day. Most of the accidents can be saved by providing the necessary safety features to vehicle. In a few years, the demand for autonomous vehicles will tremendously increase. The safety of self-driving cars is the prime focus on which most of the automobile industry and research organizations are working tirelessly. Although research on autonomous vehicle is currently happening across the world, the solutions developed cannot be directly utilized in the Indian scenario due to the unorganized traffic conditions, extreme weather condition and large population. An algorithm for environment perception like object detection, tracking and classification, lane keeping, Speed detection and tracking of ego-vehicle and nearby dynamic objects, etc. based on multiple sensors is required to develop an autonomous vehicle. Also, self-driving cars need an eye of a driver to make decision to drive safely. Therefore, High-Definition Maps are required to give detailed information for the self-driving task. It contains a huge amount of driving assistance information. Navigation maps which are in existence have meter level accuracy but HD Maps will have centimetre level accuracy for localization and path planning for navigation. The primary sensors used to achieve the autonomous vehicle are LiDAR (Light Detecting & Ranging), Radar, Camera. Also, GPS and IMU is required for the navigation.

To enable the self-driving cars Algorithm for environment perception and navigation with very high accuracy are required which can avoid obstacle and safely navigate from source point to destination using multi-sensor perception. As we know that there is a limitation of visual based sensor like camera in dark and bad weather condition. Efficiency of LiDAR is limited in extreme weather condition like heavy rain and dense fog. While as Radar works well in all-weather but the data from radar is very sparse for detecting and tracking obstacles. So, to overcome the individual sensor limitation, the sensor-fusion based algorithm is in demand which will be used in all-weather condition.

There are six levels of autonomous vehicle described by the Society of Automotive Engineers (SAE) as shown in Figure 1. In Level 0, Autonomous vehicle is fully controlled by the driver while as in Level 6, vehicle will control all the driving tasks. Also, most of the research predict that the demand for the Autonomous Vehicle will increase 10 times in coming 5 years. As it can improve productivity while travelling and reduce accidents.

The four basic building blocks of autonomous vehicle are Perception, localization & Mapping, Path Planning and Control.

Perception: Perception is the process of perceiving environment using multiple sensors. Also, one of the major concerns to the autonomous vehicles is the performance in extreme weather condition like heavy fog in winter morning and rainy session where the sensors like camera and LiDAR don't perceive the scenario due to low visibility, which may lead to improper function of vehicle. In that case fusion of LiDAR, Radar and Camera is required to visualize the environment around the vehicle. Perception task includes object detection, tracking, speed detection, lane keeping and etc. Obstacle detection is performed by determining the objects present in the path of vehicle. The different kind of objects are detected and classified using state of the art deep learning algorithms. The objects can be classified into cars, pedestrians, bikes, etc. Object tracking is used for track the dynamic objects in the scenario. It also adds or remove the objects in the frame. Object tracking techniques for autonomous vehicles must have both high speed and accuracy for real time application. Speed detection is used to classify whether the objects are dynamic or static. It is also used for determining the speed of the objects detected. The autonomous system must also be able to accurately predict speed in order to avoid collisions.

Localization and Mapping: Localization is the process of determining the location of vehicle, relative to objects in its environment. Mapping is the process
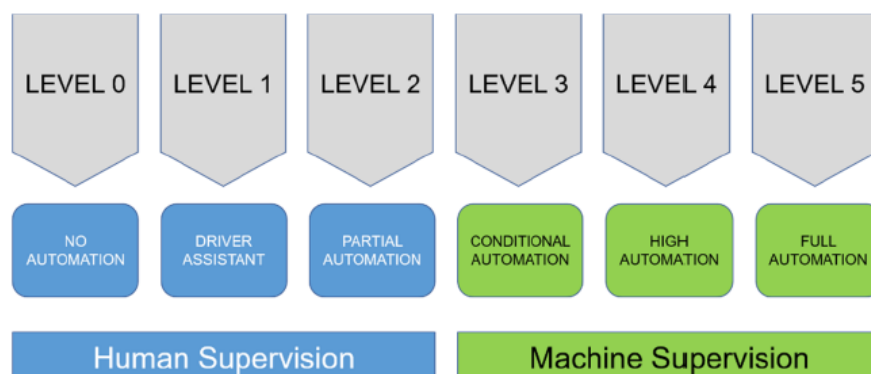

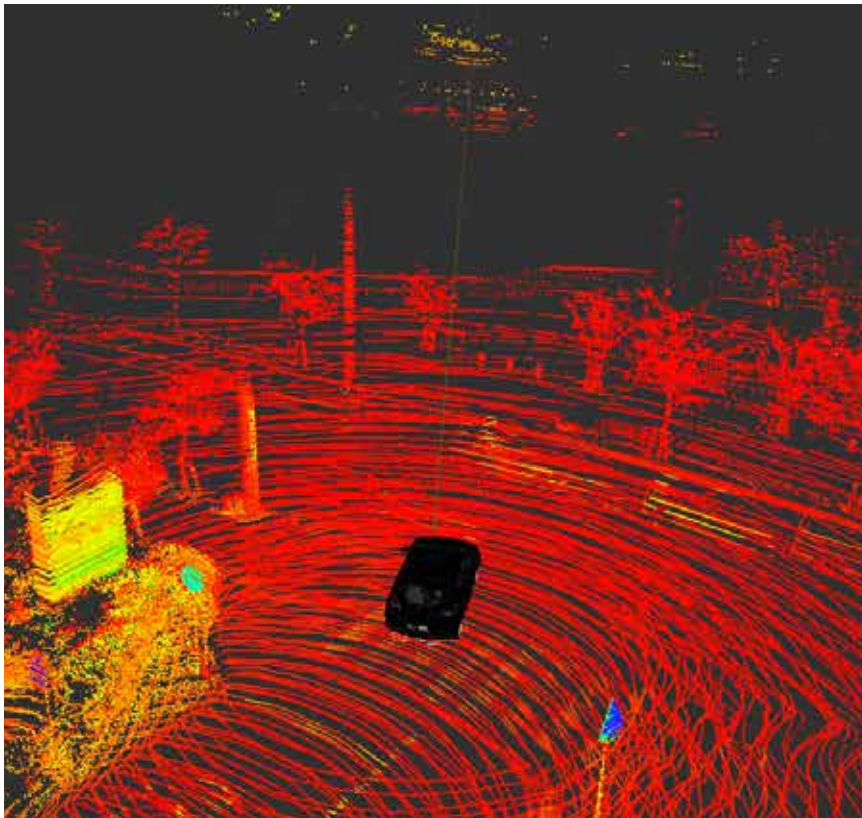**Fig 1:** 6 Level of Autonomous vehicles described by SAE

Fig 2: Simultaneous Localization and Mapping using LiDAR

of building maps based on data acquired from one or more sensors. Collectively Localization & mapping is known as Simultaneous Localization & Mapping (SLAM) as shown in Figure 2. SLAM is a technique used to building the map of an unknown environment or a known environment while at the same time keeping track of the current location of the vehicle. It matches the new measured point clouds to the previous reference and update the map with nodes or landmarks from the new

Sensor	Affected by illumination	Affected by weather	Resolution	Depth	Range	Accuracy	Cost
Camera	Yes	Yes	High	No	<150m	Low	Low
Radar	No	No	Low	Yes	50 - 300m	Medium	Medium
LiDAR	No	Partially	Medium	Yes	30 - 200m	High	High

Table I: Comparison of different sensor

AV application	Fused Sensor	Limitation without fusion	Advantages using fusion
Object Detection	Lidar & Camera	Illumination, Night vision difficulty, Low resolution of Lidar	Depth, range and accuracy
Localization & Mapping	GPS and Lidar	Poor function in GPS denied area	Continuous navigation, correction in localization
Positioning & Navigation	Lidar Map, Camera and GPS	GPS denied area and road marking	Road marking detection, HD Map
Perception in Bad weather	Lidar, Camera and Radar	Poor functioning in bad weather like fogs and rain.	All weather solution of autonomous vehicle

Table II: CAdvantages of sensor fusion for different autonomous vehicle application

point clouds. This plays an important role in GPS denied conditions, where localization done based on the Lidar or camera sensor. It helps to track the position of the vehicle with the help of estimation, keeping in account the reference position. Apart from the navigation map and point cloud 3D map, we can make the HD maps which will provide the rich details to vehicle about the surroundings and give an eye to self-driving vehicles.

Planning: Path planning used in finding the possible paths from source to destination. It also used in finding a path to evade traffic and navigate through it. Based on the dynamic object, the path planning is done to avoid the obstacles. After detecting the obstacle, the vehicle will make the new path to reach the goal. Planning is the process of planning trajectories with the knowledge of the environment and the vehicle's position. Improvement for Accuracy and computational efficiency for perception and navigation algorithm are very important for autonomous vehicle. Inefficient algorithm can be replaced by deep learning algorithm which will accelerate the performance and accuracy of the system.

Control: Once the above three function is implemented then the actuators come in the action where the control algorithms are developed to actuate the vehicle in different driving situation.

Sensors:

The perception sensors like cameras, LiDAR or radar have their own advantages and drawbacks in different environment scenarios. Camera gives the rich colour and visual information but it lacks in providing the depth information. LiDAR gives the depth information of object but it is very sparse and does not have the colour information. Radar is not affected by illumination and have high range. Radar uses radio frequency waves, so it has a lower resolution as compared to LiDAR. we will see the comparison of different sensors and their capability to be used in the different environment. From table I, we can conclude that Lidar is used for high level accuracy of autonomous vehicle with medium range. Camera gives us a lot of visual information. But both lidar and camera is affected by bad weather. While as Radar have higher range. It also works in bad weather condition as it emits radio waves which can penetrate
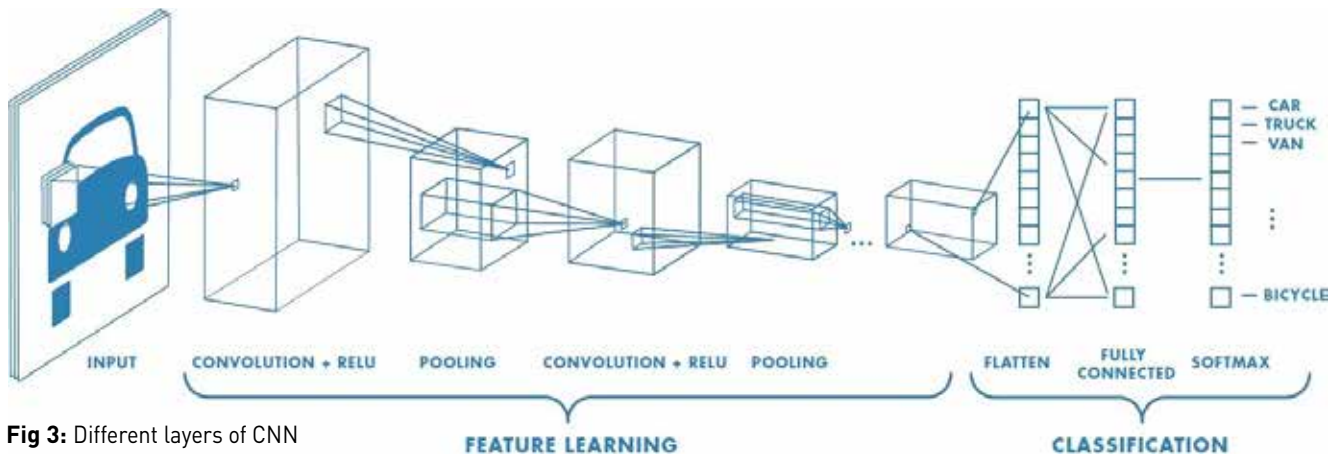
Fig 3: Different layers of CNN

in rain and fog. But Lidar have highest accuracy as compared to the counterparts in price of high cost. So, we need a vehicle consisting of Lidar, Radar and Camera for all weather condition.

Approach to the sensor fusion:

Classical Approach: It uses Statistical and Probabilistic model. It is having high Computational Complexity. Also, it Requires prior knowledge of system model and data. Also, it can achieve low to medium level of fusion.

Deep Learning Approach: It is the current state of the art technology used for Autonomous vehicle. Convolutional Neural Network (CNN) based models are used widely for the object detection and classification. Different layers for the object detection are shown in the Figure 3. First, the input image data is given to the input layer. Then, various important features are extracted from the image using convolution layers. Later, pooling is done to reduce the computational complexity by keeping most important information and ignoring the redundant information. In fully connected layers, all neurons are connected with some weights and classification is done. Hence, the final output is produced with classification probability. Advancements in CNN are seen

in few years from the two-stage detector to single-stage detector. R-CNN is one of the popular two stage detectors in which image is proposed into different regions then CNN is applied for the detection. R-CNN model gives high accuracy but it is a slow

process which is not useful for real time application of autonomous vehicle. Then various advancement is seen in R-CNN. Fast R-CNN is proposed to increase the speed in this, Input image is directly processed using CNN to produce a convolutional feature
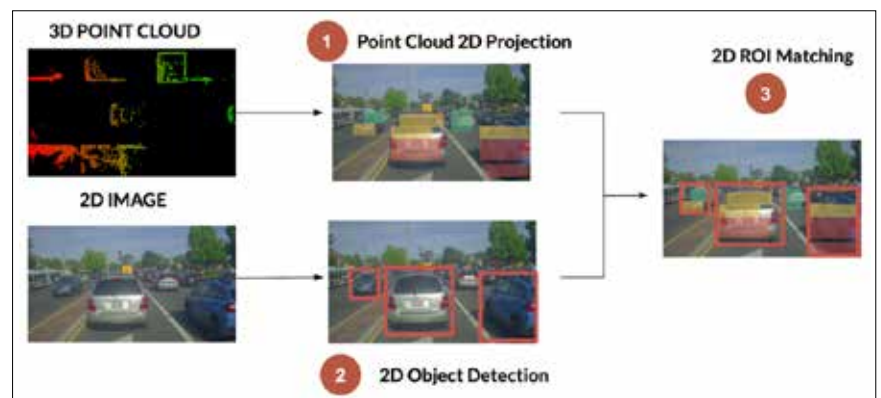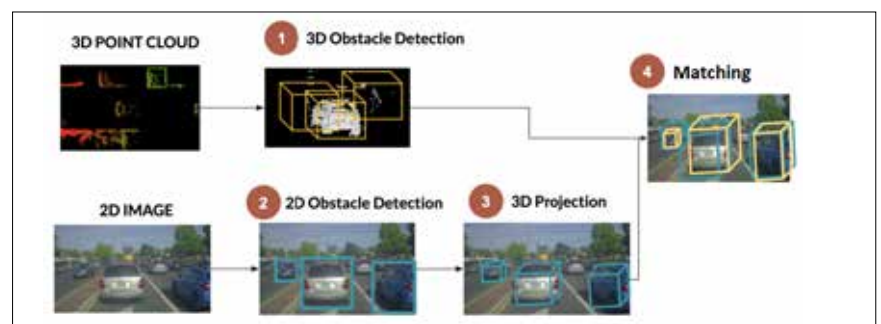

Fig 4: Early sensor fusion

Fig 5: Late sensor fusion

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map. Now a days single stage detector like YOLO, SSD are used which gives faster result. The loss of accuracy is compensated using the sensor fusion technology. It is used widely in autonomous vehicle.

Methodology:

Sensor fusion is one of the most vital

technologies to enhance the accuracy and speed of detection process in all-weather condition. When one of the sensors is less efficient then using the fusion of multiple sensors, we can enhance the accuracy of the perception algorithm. Sensor fusion can be done in two ways which are described as below:

Early Fusion: In early fusion raw data like point cloud from Lidar and camera image are fused before processing. It is also known as high level fusion. It follows the 3-step process as shown in Figure 4. First, the 3D Lidar point cloud is projected into 2D camera image frame by transformation into homogeneous coordinates and applying some translation and rotation process then it is returned back to Euclidean coordinates. Second, object detection is done using various deep learning technology like R-CNN or SSD or YOLO. Finally, the matching of Region of Interest is done. We need to perform the intrinsic and extrinsic calibration of the camera and LiDAR sensor by following the process, so that the 3D point cloud of LiDAR can be projected onto the image frame.

Late Fusion: In late fusion, result is obtained independently from Lidar and camera sensor. It follows the 4-step process as shown in Figure 5. First, 3D object detection is done using Lidar. Then camera detects the object in 2D and it is projected into 3D space. Then intersection of union matching is done to get the final result.

One of the solutions to the recognition and detection of the object is 3D Computer vision technique, because volumetric images contain more information give better quality and less noise as compared to the 2D images. So, to make it reliable technology, the focus is required on the Deep Learning technique to improve the performance like reliability, accuracy, effectiveness and robustness of sensor fusion network.

There is some limitation without sensor fusion but fusion brings the desired output as shown in Table II.

Conclusion:

To summarize, the semi-autonomous vehicle is well developed in many countries and to make it fully autonomous, we need to rely on various sensor and take decision, as if one sensor fails other will work. Sensor Fusion is one of the keys enabling technology for self-driving cars to work.❏

Shell plans to install over 10,000 charging points across India by 2030

Shell launched its first electric vehicle chargers in India, for the four-wheeler and two-wheeler segments in Bengaluru. India is the first market for Shell to launch chargers for two-wheelers. The company plans to set up more than 10,000 charging points across India by 2030 and aims to provide safe, green, and integrated mobility solutions to its customers through the Shell Recharge Stations. The power on the Shell Recharge chargers is 100% green energy *(All electricity Shell purchases to supply at the Shell Recharge sites, is matched with equivalent amount of units of Renewable Energy Certificates (RECs) from 100% renewable sources).*

In the first phase of its launch, Shell plans to set up charging stations in Bengaluru across its fuel stations located in Yeshwantpur, Marathalli, Old Madras Road, Brookefield and Kanakpura. The company has plans to expand its EV charging infrastructure beyond its existing retail markets of Karnataka, Tamil Nadu, Maharashtra, Gujarat, Telangana, Assam, Andhra Pradesh. Shell will provide customized charging solutions at on-the-go locations such as Shell fuel stations, standalone EV hubs, home charging and destination locations. For on-the-go and standalone EV hubs, the company will deploy 100 kilowatts (KW) and above direct-current (DC) fast chargers to enable fast charging and the lowest possible dwell time.

Customers will be able to operate these chargers through the 'Shell Recharge India app'. The app provides a hassle-free, reliable EV charging experience to customers, allowing them to locate the nearest available charger, pick a charging method – by unit, time, or by percentage and then make quick payments. Customers can also view their charging status on a real-time basis.

Hero MotoCorp, Hindustan Petroleum partner to set up charging infrastructure for electric vehicles

Hero MotoCorp and Hindustan Petroleum Corporation Limited (HPCL) have collaborated to set up charging infrastructure for electric vehicles (EVs) in the country. The companies will set-up charging infrastructure for two-wheeled electric vehicles across the country.

The two companies will first establish charging infrastructure at HPCL's existing network of nationwide energy stations, with the likelihood of subsequently broadening the collaboration for supplementary business opportunities.

In the first phase, charging stations will be set up in select cities, which will then be expanded to other key markets with the aim of establishing a high density of EV charging station network across the country. Hero MotoCorp will lead the infrastructure development for the charging network. Each charging station will feature multiple smart and fast chargers, including DC and AC chargers that will be available to all two-wheeled EVs. The entire user charging experience will be controlled by a Hero MotoCorp Mobile-App, based on a cashless transaction model.

Mercedes-Benz rolls out the 'Made in India' EQS 580 4MATIC

Mercedes-Benz achieved a significant milestone in its India journey, by rolling out the country's most advanced and sophisticated luxury Electric Vehicle – the EQS 580 4MATIC. India is the first market outside Germany to manufacture the EQS 580 4MATIC. The EQS 580 4MATIC, which becomes India's longest range EV, is a design and technology marvel and sets new benchmark in the luxury EV segment. The luxury EV's India rollout reiterates Mercedes-Benz's commitment for offering the Indian customers, the most desirable and technologically advanced, futuristic products from its global portfolio. The launch of the EQS 580 4MATIC also underpins Mercedes-Benz's global vision towards achieving a climate neutral car fleet in the foreseeable future. The local manufacturing of the EQS 580 4MATIC underlines Mercedes-Benz India's global competencies accomplished in flexible production at its state-of—the-art manufacturing facility that now produces series, Maybach, AMG and luxury EVs, all under one roof.

Product Highlights:

The EQS 580 4MATIC boasts of a drag coefficient from 0.20. This contributes to the luxury saloon being India's longest range EV with 857 kms range (ARAI certified). The high power density of the lithium-ion battery comes with usable energy content of 107.8 kWh and is equipped with a powerful 400 volt battery manufactured using the latest lithium-ion technology. It is equipped with superior technology through the advanced infotainment system MBUX Hyperscreen.

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