SRINIVAS GROUP
SAMAGRA GNANA
ESTD: 1988

Auto Thrust

When we thrust, we leave everyone in dust.....

April 2020 | Srinivas Institute of Technology, Mangaluru | Volume 4, Issue 2

H.O.D'S MESSAGE

I am happy to see that the second issue of "Auto Thrust" E - news letter coming on time despite the academic disturbance created by the pandemic COVID-19. The activities in the second half of the current year could not be completed as per the plan for the same reason, but overall, I am satisfied that students got lot of exposure owing to industrial visits, interaction with the society, E-baja and M-baja vehicle fabrication and participation at National level, self development programs etc., to mention a few. For the first time in the history, department bagged 2 University Ranks. On behalf of the faculty and the management I congratulate Mr. Godwin and Mr. Vikesh for achieving this rare feat.

With the classes turned to 'online' mode, the remaining syllabus shall be covered by the faculty using 'Virtual Class Room' apps, very effectively, till the lock down gets over. My request to the students is 'please attend all the online classes regularly, interact with the faculty and use the supplementary soft materials given to you, sitting at home. Maintain social distancing and stay home, stay safe. Be prepared for the upcoming IA tests and semester end exams'.

I take this opportunity to thank the editor and the editorial board committee of 'Auto Thrust' for the excellent work done.

Dr. Ramakrishna N. Hegde

SRINIVAS GROUP
SAMAGRA GNANA
ESTD: 1988

Auto Thrust

When we thrust, we leave everyone in dust..

Department of Automobile Engineering

Srinivas Institute of Technology, Mangaluru

Imagination is more important than Knowledge

Volume 4, Issue 2

April - 2020

Inside this issue:

ELECTRIC VTOL AIR-TAXI CONCEPT

Hyundai has an ambitious initiative to step into the world of mobility solutions, which in-part includes this rather large tilt-rotor aircraft. The automaker partnered with Uber to produce this concept – known simply as an Urban Air Taxi – which will ferry people around cities. Hyundai will produce the vehicles, and Uber will handle the red tape associated with minor issues like airspace control and connecting people on the ground to the air taxis. You know the sort of stuff that requires you to arrive 90 minutes before your scheduled departure time at airports.

Hyundai at CES 2020 revealed a full-size electric vertical-takeoff-and-landing (eVTOL) "air taxi" concept and confirmed it has joined Uber's aerial rideshare initiative known as Elevate. Hyundai said the S-A1 concept, in addition to its VTOL configuration, is designed for cruising speeds up to 180 mph (290 km/h) for trips of up to 60 miles (97 km). Operating altitudes are targeted at between 1,000 to 2,000 ft. (300 to 600 m) for the four-passenger vehicle. The S-A1's performance is within Uber Elevate's broad guidance for urban aero-rideshare designs.

In conjunction with the S-A1 aircraft, Hyundai's also revealed a new infrastructure concept called the Hub. The intent is for many types of electric wheeled and non-wheeled purpose-built vehicles (PBVs) to dock and connect to a Hub for connecting air and ground trips.

SOURCE: SAE INDIA

E-AXLE FOR RALLYCROSS RACING

Transmission Technology Company Xtrac has unveiled its advanced e-axle system for the first electric-powered cars to compete in the 2021 to 2024 FIA World Rally cross Championship. With each 4WD vehicle equipped with two single-motor e-axles, one for the front axle and one for the rear, the P1316 e-axle will be supplied to Austrian company Kreisel, which has been selected as the supplier for the phased introduction of a battery-powered propulsion system. Kreisel is responsible for the state-of-the-art motors, inverters and battery.

Xtrac's latest addition to its integrated lightweight electric vehicle (ILEV) range has an overall ratio of 7.90:1 and is suitable for use with motors with a power rating of 250kW and an input speed up to 15,000rpm.

Lubrication is provided through an internal eccentric rotor pump with pressure feed to all critical areas, as well as a semi-dry-sump oil pickup to minimize churning losses and optimize overall gearbox efficiency, with the option to fit an externally mounted oil cooler.
The differential is a multi-plate ramp type limited-slip differential with adjustable pre-load which, as an option, can be adjusted externally. Output flanges are explicitly designed for the application, meaning that the driveshaft length can be optimized for each vehicle type if required.

SOURCE: SAE INDIA

PHOTOGRAPHY BY
MANISH (8TH SEM)

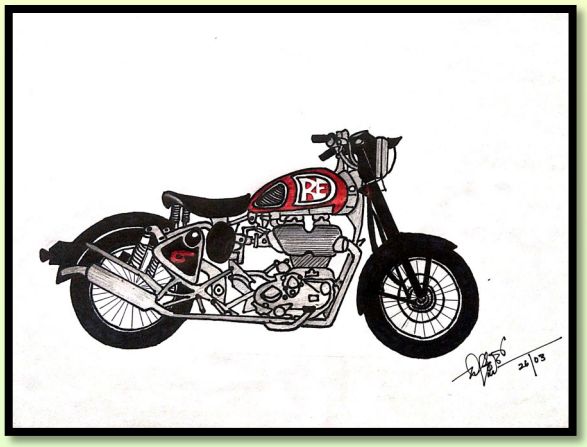
ART BY
ASHWIN (8TH SEM)

PHOTOGRAPHY BY
SAVYASACHI K G (6TH SEM)

ART BY
SPANDANA (6TH SEM)

Photography & art by Usama (6th sem)

Art by deekshith (6th sem)

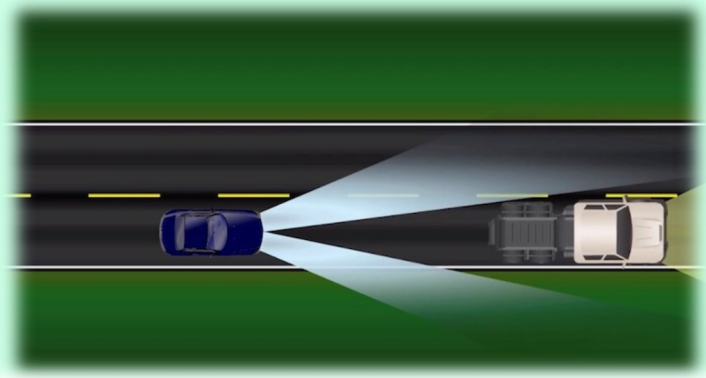


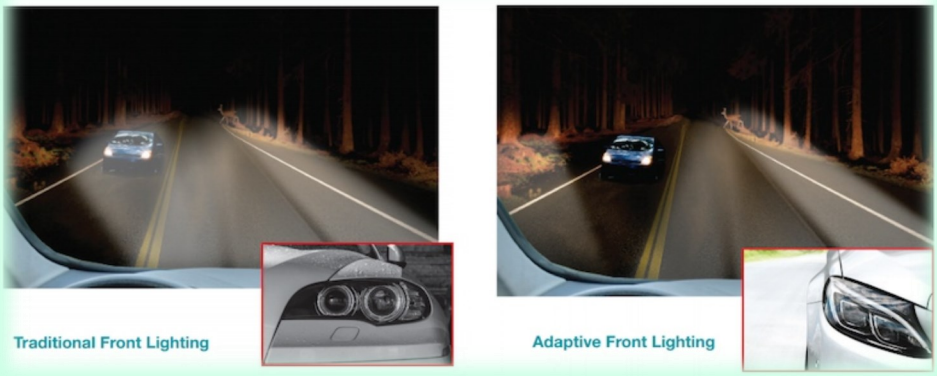
Photography by Ashwin H (4th sem)

Introduction to Adaptive Front Lighting Systems (AFS)

Adaptive front lighting systems (AFS) attempt to dynamically adjust the headlights of the vehicle so that the driver has optimum nighttime vision without compromising the safety of other road users. The AFS uses stepper motors to control the headlight angle when the vehicle steers or the road is not even. Besides, the adaptive system tries to avoid a direct glare to oncoming vehicles. It uses headlights that consist of an array of LEDs.. Depending on the position of the oncoming car, some of these LEDs are automatically dimmed. In this way, while around the oncoming car is illuminated, the driver side is dimmed. The AFS uses image sensors to detect the position of the oncoming vehicle.

Similarly, the AFS avoids blinding the driver of the preceding car by not directly shining onto its rear-view mirror.





The AFS consists of several different building blocks, such as LED drivers, LED matrix managers, stepper motors, imaging sensors, MCUs, etc.

LED Driver for Automotive Applications

The functionality of the AFS depends on producing complex light patterns at a fast rate. LEDs exhibit an illumination rise time about two times faster than that of incandescent sources. Besides, LEDs are more power-efficient and offer a superior clarity of white light. Due to these advantages, they are widely utilized in the automotive industry. To produce the light patterns required by the AFS, we can incorporate an array of LEDs in the headlight and selectively turn some of them on. To operate the LEDs, we need special circuitry referred to as LED drivers. The driver should provide the LEDs with a constant current to preserve the light color.

Kaushik
8th sem Automobile Engg

The Connected Vehicle

The "Connected Vehicle" is any vehicle that is able to communicate with the cloud and/or the transport infrastructure, and broadcast relevant information (e.g. vehicle on-board sensor data) into the cloud. Here the vehicle itself can be equipped with relevant capability (SIM card embedded within the vehicle),or the relevant capability can be provided by pairing the vehicle with a mobile phone device or an embedded device that can read the sensor data and broadcast the data (e.g. a dongle that plugs into the vehicle On-Board-Diagnostic port, i.e. OBD port).

Data of value that can be extracted from the vehicle and potential use-cases include:

- GPS location and speed. Use cases for this data include real-time congestion reporting and forecasting based on GPS traces.
- High-resolution vehicle-internal bus voltages including the voltage/current of the car battery during the ignition event. Use-cases here include predictive models that can forecast battery failure and automate the process involved with offering battery replacements to motorist before the actual battery failure event.
- High-resolution accelerometer and gyroscope data, which can be leveraged to automatically detect accidents and abnormal driving behaviors with predictive models that look for patterns that signify a crash and/or other abnormalities.
- Vehicle-internal error codes that signify faults. These can pinpoint individual faults with individual components as well as be aggregated, as part of a classification model, to identify higher-level faults.
- Radar sensors and dashboard video cameras that broadcast information about road conditions, parking conditions and road signage back to a central provider for analysis and broadcasting.
- Real-time traffic light and road intersection conditions/states. Use-cases here include traffic light states being broadcast directly into the vehicle and predictive models that forecast traffic light conditions to maximize the number of cars arriving at intersections when the traffic light is green. In the future, this information could also be fed into autonomous vehicles to optimize both inter- and intra-vehicle coordination.

Mr. Prakash S.T.
Asst. Professor
Department of Automobile Engineering

An Awareness Program on "Road Safety and Measures."



Awareness program on Digital Transactions and Net Banking


NEBULA 3.0 ATV Championship Participants


FLASH 2.0 FMAE Championship Participants

AUTO EXPO 2K20 Promo Event

Bajaj Dominar 250

Engine type	Single cylinder, 4 stroke, DOHC,4valve, Liquid cooled, Twin Spark ,FI
Max Power	27 Ps @ 8500rpm
Max Torque	23.5 @ 6500rpm
Gearbox	Wet, Multiplate with ANS
Battery	12V, 8Ah VRLA
Frame	Beam type perimeter frame
Front Brake	300 mm Disc ABS
Rear Break	230 mm Disc ABS
Front & Rear Suspension	Telescopic, 37mm USD Fork, 135mm travel (F) Multi-step adjustible Mono shox with Nitrox, Wheel stroke of 110mm (R)
Tyre	10130/70-17" Tubeless (F) 130/80-17" Tubeless (R)
Seat Height	800 mm
Wheelbase	1453 mm
Kerb Weight	180 kg
Ground clearance	180 mm

Ultraviolette F77

Motor Power	25000 W
Motor Type	AC motor
Charging Time	1.5-5 Hours
Max power	33.9 Ps @2250 rpm
Max torque	90 Nm / 450 Nm (Motor)
Front Brake	Disc
Back Brake	Disc
Range	130-150 km/charge
Chassis	Steel trellis with aluminium bulk head
Wheelbase	1340 mm
Kerb weight	158 kg
Battery Type	Lithium-ion
Transmission	Automatic

Tata Nexon EV

Motor Type	Permanent Magnet Synchronous Motor
Electric motor power (PS)	129*
Maximum Torque	114Nm@4000rpm
Electric motor torque (Nm)	245 Nm
Drive modes	Multi Drive modes (Drive & Sports)
Battery pack	30.2 kWh High energy density Lithium ion battery pack
Ingress protec-tion for motor & battery pack	IP 67
Front Suspension	Independent MacPherson strut with coil spring
Rear Suspension	Twist beam with dual path Strut
Brake Type	Disc, Drum
Length	3993mm
Width	1811mm
Height	1606mm

Toyota Vellfire

Engine Type	Gasoline Hybrid
Maximum Power	86kW (115 BHP) @4700 rpm
Maximum Torque	198Nm @ 2800-4000 rpm
Front Motor **Rear Motor**	105 kW @ 4500 rpm 50 kW @ 4608 rpm
Hybrid Battery	Nickel Metal Hydride
Suspension	Front McPherson; Rear Double Wishbone Front and Rear Stabiliser Pitch and Bounce Control
Drive Type	E-FOUR (Electronic 4WD)
Tyres and Wheels	225/60R17, Hyper Chrome Alloys
Length	4935mm
Width	1850mm
Height	1895mm
Wheel Base	3000mm

Your talent is God's gift to you. What you do with it is your gift back to God.

Automotive Maintenance System

Predictive analytics is one of the most startling features of IoT automotive. The sensors embedded in different components of a car collect data and share it to a platform. This data is then processed by an algorithm that can analyze the future outcomes of the component based on its performance.

IoT automotive maintenance system also helps a person to take necessary steps to prevent its car parts from sudden breakdown. Just like dashboard indicators of a vehicle, this system alerts the driver about probable malfunctions. However, the alerts are sent to the driver's mobile, way before the problem even occurs. This helps the driver to make cost-effective and time-saving steps to avoid component failure while driving.

The capabilities of predictive maintenance can be implemented to an individual vehicle as well as to a fleet. It is really helpful for load-carrying vehicles that travel for days before reaching their destination. By using the automotive maintenance system a person can confirm the performance of its vehicle and repair its car parts before they break.

Autonomous Vehicles

Autonomous vehicles are a hot topic among automobile makers. Various car manufacturers are trying to develop a fully autonomous car that will assume all driving functions from the driver. Even though developments have been made in this area, a fully independent vehicle is still to be developed.

However, semi-autonomous vehicles have been manufactured that partially assists drivers with driving, braking, parking, and lane changing activities. IoT infused semi-autonomous cars take on-spot decisions while partly controlling the vehicle operations to avoid accidents and reduce the load from the driver. Along with different proximity sensors and cameras, cars are integrated with IoT systems to reduce human error and make driving more comfortable and safe.

In-vehicle Infotainment and Telematics

In-car Wi-Fi Capabilities powered by 4G LTE connection has enabled telematics features to IoT based automotive. Telematics refers to the long transmission of computerized data. By using vehicular telematics a car owner can keep an eagle eye view on its vehicle even from remote locations.

Through a smartphone-enabled dashboard, car owners can be ensured about its security, surveillance, and safety at all times. External sensors and cameras keep a track of the vehicles' condition and send the data to a mobile application. Telematics system along with real-time alert system sounds an alarm in the owner's smartphone if someone tries to forcefully enter the vehicle without proper access. The smart car enabled with IoT also calls concerned authorities immediately like ambulance or firefighters in case of an emergency.

Wi-Fi capabilities have also given rise to smart infotainment systems along with other smart car features. The owners can connect different equipment like music system and GPS in a car with their smartphone and operate them distantly. Currently, there are various in-built and third-party applications that a person can use to connect his vehicle with mobile.

Voice command accessibility in these application allows a person to play its favorite music, stream a video, or attend calls without even lifting a finger. The GPS and GNSS system in the infotainment systems also offers onboard navigation and comprehensive information about nearby petrol pumps, restaurants, and other points of interests.

Conclusion:

Internet of Things along with other disruptive technologies is revolutionizing the complete automotive industry. Evolution in this field has brought in the emergence of trailblazing development in automobiles in terms of connected and automated cars. Its usage has revamped car inspection and maintenance capabilities and presented new mediums of entertainment. Moreover, vehicular telematics is allowing long-range data transmission that has helped in the emergence of an IoT powered fleet management system.

IoT applications in the automotive industry are increasing day by day. With the enhancement in the technology of Internet of Things, more refined automobile use cases will pop up that will completely change the way in which we interact with our vehicles.

AUTO EXPO 2K20 Promo Event

AUTO EXPO 2K20 PROMO was held on 5th April 2K20 on the occasion of ENVISION 2020. The event was inaugurated by our Principal Dr. Shrinivasa Mayya D, Head of the Automobile Department Dr. Ramakrishna Hedge , Prof. Varun and Owners Dhanush Shetty (Cruze), Ratan Kevin Peter (Thar), Munaim Hashmi (Swift), Rancil (Vento), Shashank(Civic),Jeeth Ep (Padmini), Prem (Harley Davidson 883r), Rajesh (Hayabusa), Daivik(Ninja650), Kizal (Polo) & Coordinators are Ratan Kevin Peter, Munaim Hashmi, Mehul Amin & Savyasachi KG and Students of Automobile Department were present. The dignitaries revealed the date of the Mega Event AUTO EXPO 2K20. The main highlight of the event were the modified cars and super bikes that enthralled the audience. A photo contest was organized where in the audience were given a chance to click photographs with the automobiles.


C-TX 5775


Kawasaki
650
Kawasaki


KA 51 N 4870


AUTOEXPO 2K20
VISUAL CONCEPT
PRODUCTIONS

VTU Automobile Branch toppers
Mr.Godwin(3rd rank)
Mr.Vikesh (6th rank)

Final year students
Mr.Omprakash,Mr.Kaushik,Mr.Manish
(Winners of national level fest)

Second year student
ENVISION 2020 logo
designed by Mr.Charan

Third year students

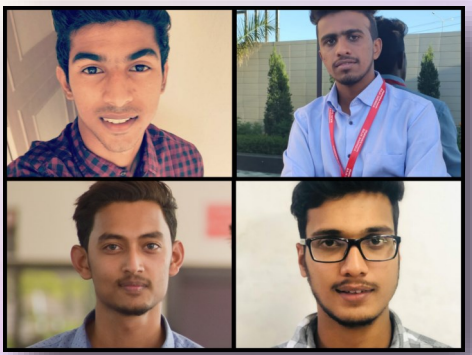
Mr.Savyasachi
(Best Poster & Banner designer)

Mr.Manjesh
(Winner of Eastern Singing)

Ms.Spandana
(Winner of various events)

NEBULA3.0 15th Rank in ATV Championship

FLASH2.0 4thRank in FMAE Championship



KSCST Sponsored Projects 2019-2020

Mr.Shreyas B.G., Mr.Mohd. Farhan ,
Mr.Mohd. Shahin A.H., Ganesh Bhat G.V.

Mr.Ryanish Allen Rego, Mr.Sourav ,
Mr.Prekshith R.,Mr.Yakshith

For feedback - +91 8951225467 (Prakash ST), prakash0435@gmail.com