K.S.R. COLLEGE OF ENGINEERING

(APPROVED BY AICTE & AFFILIATED TO ANNA UNIVERSITY)

K.S.R. KALVI NAGAR,TIRUCHENGODE - 637 215

25 YEARS 2001 - 2026 Celebrating Academic Excellence

VOL 16

ISSUE 02

DEPARTMENT OF AUTOMOBILE ENGINEERING

AUTOEVON'25

MAGAZINE

JANUARY 2025 - JUNE 2025

K. S. R. COLLEGE OF ENGINEERING

An Autonomous Institution

(Approved by AICTE, Affiliated to Anna University, Accredited by NAAC A++ Grade)

K.S.R. Kalvi Nagar, Tiruchengode-637215, Namakkal District, Tamil Nadu.

DEPARTMENT OF AUTOMOBILE ENGINEERING

AUTOEVON'25

TECHNICAL MAGAZINE

(Volume 16 / Issue 02 / June 2025)

ACADEMIC YEAR 2024-2025

K. S. R. COLLEGE OF ENGINEERING

An Autonomous Institution

With the Blessings of our Beloved Founder

Forever in our hearts,

Forever in our thoughts!

K. S. R. COLLEGE OF ENGINEERING

An Autonomous Institution

Chairman's Message

Vision looks in ward and become duty.

Vision looks outward and become aspiration.

Vision looks upward and become faith.

Shri R. Srinivasan BBM., MISTE.,
Chairman, KSR Educational Institutions.

Education is the foundation of a brighter tomorrow, and this magazine reflects the vibrant spirit of our learners. May it continue to inspire creativity, excellence, and lifelong curiosity in every reader. In the recent times, the role of KSRCE is to carry out proactive research and development activities to make the students as well as faculty member's intellectuals, which are very challenging and demanding. It is of great significance that this magazine is going to deliberate upon It will definitely explore new areas of practice and enhancing quality of professional services. I am sure this magazine will be a milestone in ensuring the highest standards in this profession. I wish the organizers the very best in this and all their other endeavors. I am eagerly looking forward to seeing you and enjoying this magazine.

K. S. R. COLLEGE OF ENGINEERING

An Autonomous Institution

Dean's Message

Dr. M. Venkatesan
Dean – KSRCE

I am delighted to extend my warm wishes to the Department of Automobile Engineering for the successful launch of the AUTOEVON'25 magazine. This remarkable initiative stands as a reflection of the department's unwavering commitment to fostering knowledge sharing, innovation, and awareness in the dynamic and ever-evolving field of Automotives.

The insightful contributions from both students and faculty members, as showcased in this magazine, are a true testament to their dedication, creativity, and technical excellence. It is encouraging to see such a platform being established to spotlight emerging trends, thought- provoking perspectives, and real-world applications in Automobiles.

I wholeheartedly encourage everyone to actively engage with AUTOEVON'25, leveraging it as a valuable medium to share insights, explore new ideas, and collaboratively strengthen the cybersecurity ecosystem. My heartfelt congratulations to the entire team behind AUTOEVON'25 for their exceptional efforts and vision.

K. S. R. COLLEGE OF ENGINEERING

An Autonomous Institution

Principal's Message

Dr. P. Meenakshi Devi,
Principal, KSRCE

As a Principal of KSRCE, I actively play my role to facilitate students to become best academicians, researchers and policy makers. I provide a diverse and inclusive work environment to my colleagues and drive them wherever necessary to play a role in getting utmost national and international agencies support Institution. A collaborative and integrated approach towards teaching, learning and research will be emphasized. I strongly believe that the KSRCE team will overcome the constraints facing to deliver the best Engineering services to the society and reach the desired goals

K. S. R. COLLEGE OF ENGINEERING

An Autonomous Institution

HOD'S Message

Prof. Dr. R.VENKATACHALAM.,
Head of the Department - AE

It is a pleasure to present this edition of our Automobile Engineering magazine. Our department continues to push the boundaries of innovation, merging engineering principles with Automotive to develop impactful Automotive Sector. Our students and faculty are driving meaningful change. This magazine highlights their inspiring work, research, and achievements. We take pride in nurturing a culture of curiosity, collaboration, and excellence. As we move forward, we remain committed to shaping the future of Automotives through technology, creativity, and dedication.

On behalf of the editorial board, proudly presenting ***AUTOEVON'25*** designed with a vision to quench the thirst by layering a platform for innovative ideas. The soul of creativity lies in the dream to unveil inherent talent. The power of this dream fueled us forward and made ***AUTOEVON'25*** a reality. We are thankful to all who contributed to fulfil our dream. First and foremost, let me thank our chairman who was always with us, to provide a wonderful platform to nourish the talents. I extend my sincere thanks to Principal who were always in the forefront to encourage and inspire to execute wonderful ideas. I thank all students and faculty coordinators for their overwhelming support to bring out ***AUTOEVON'25***.

K. S. R. COLLEGE OF ENGINEERING

An Autonomous Institution

AUTOEVON'25

CHIEF PATRON

Shri. R. Srinivasan

Chairman, KSR Educational Institutions

PATRON

Mr. K. S. Sachin

Vice Chairman, KSR Educational Institutions

ADVISORS

Dr. M. Venkatesan,

Dean, K. S. R. College of Engineering

Dr. P. Meenakshi Devi,

Principal, K. S. R. College of Engineering

Dr. R.Venkatachalam,

Mentor, AE

EDITORIAL BOARD

FACULTY COORDINATORS

Dr. G. Nallakumarasamy,
Prof/AE,

Dr. S. Neelamegan, ASP/AE,

STUDENT COORDINATORS

73152111011 - VENKATESH B, IV AE

73152111501- AKASHKUMAR P V, IV AE

73152111512 - KARTHIKRAJA R V, IV AE

K. S. R. COLLEGE OF ENGINEERING

An Autonomous Institution

VISION OF THE DEPARTMENT

Education and research to meet the need of global automotive industry and society.

MISSION OF THE DEPARTMENT

DM 1: Quality education through flexible curriculum, research and self-learning.

DM2: Training via automotive industry for a sustainable society and social development.

K. S. R. COLLEGE OF ENGINEERING

An Autonomous Institution

DEPARTMENT PROFILE

The Department of Automobile Engineering (AE) was started in the year 2009 with an intake of 60 students. Over the years the Department has steadily grown and currently the student's intake is 60. Along with B.E., the Department also offers Ph.D., degree Programme. The Department of Automobile Engineering and its stakeholders work together to create a stimulating, diverse and positive learning environment to gain knowledge. We strive to provide the highest quality of education to our students, so they can become true leaders and outstanding citizens. We constantly endeavor for research activities that will contribute to the well-being of people, the economy and the environment all over the world. As a community of individuals who value true excellence and preeminence, we seek to compete and empower one another to reach our full potential while caring for others and our environment.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO 1:

Core expertise: Apply technical knowledge and competitive in automobile engineering field**.**

PEO 2:

Sustainable Solutions: Impart inter-disciplinary skills and innovations for challenges that emerge in automobile sector.

PEO 3:

Ethical Proficiency: Enhance knowledge with professional ethics, attitude, communication and leadership skills.

K. S. R. COLLEGE OF ENGINEERING

An Autonomous Institution

PROGRAM OUTCOMES (POs)

PO1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO6: The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community
and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments

PO12: Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

K. S. R. COLLEGE OF ENGINEERING

An Autonomous Institution

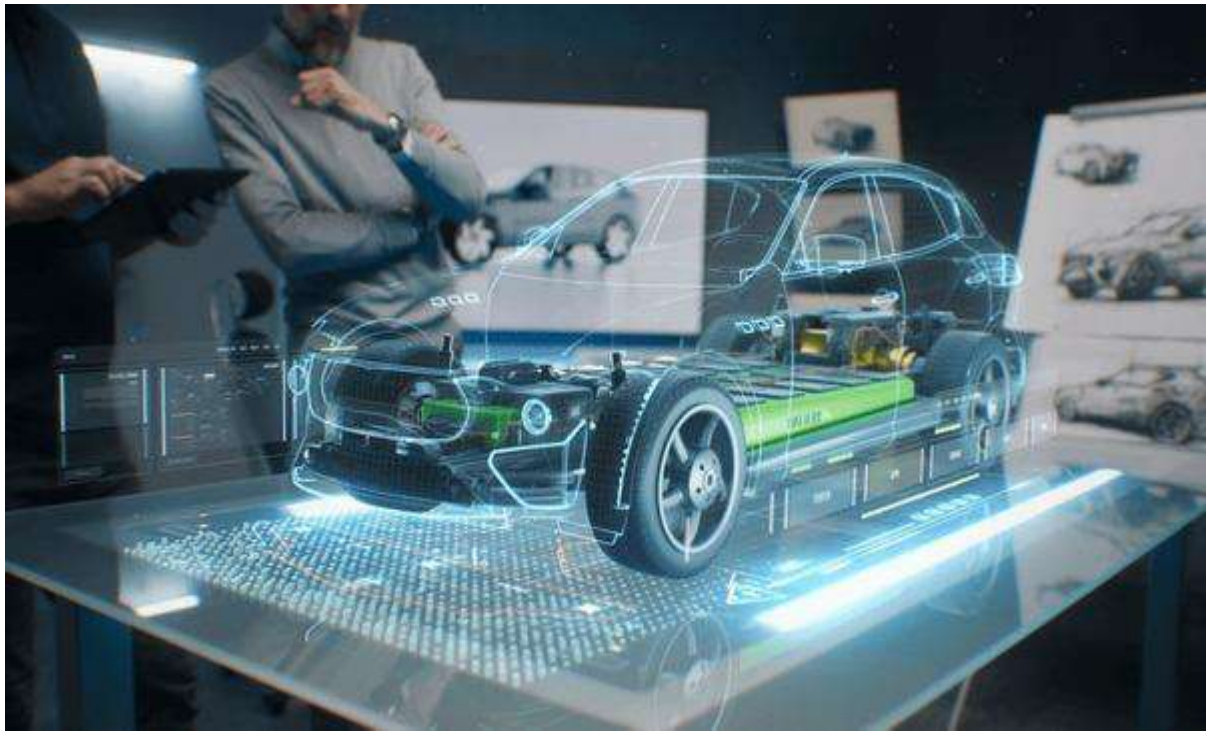
PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO 1:

Professional competency: Design and analyze automotive components, electrical and electronic systems.

PSO 2:

Troubleshoot Skills: Develop as a professional in maintenance and service of automotive systems



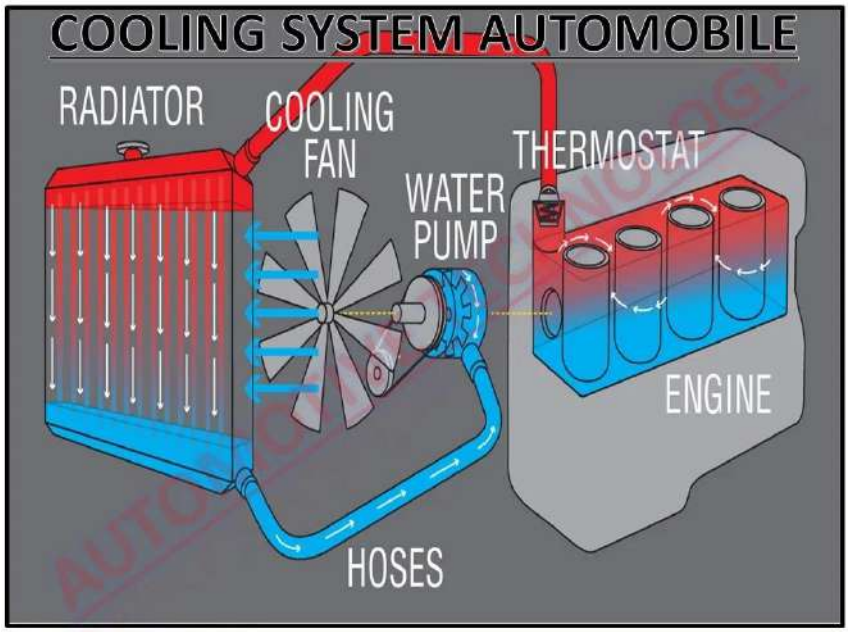
Our cars are turning into smartphones with wheels!

(Understand the Basics of the Components)

Fluid Flow and Heat Transfer in a single tube-Fin arrangement to fan Automotive Radiator

Radiators are heat exchangers used to transfer thermal energy from one medium to another for the purpose of cooling and heating. The majority of radiators are constructed to function in automobiles, buildings, and electronics. The radiator is always a source of heat to its environment, although this may be for either the purpose of heating this environment, or for cooling the fluid or coolant supplied to it, as for engine cooling. The radiator designs at present depend on the empirical methods, wherein existing experimental data is used as the thumb rules for the design process. However, for any preliminary design the performance of the radiator can be accessed through Computational Fluid Dynamics (CFD) in prior to the fabrication and testing.

In the current study a tube fin arrangement of an existing radiator is analyzed for evaluating the fluid flow and heat transfer characteristics. The geometry of the finned-tube heat exchanger is an intricate one and there are no analytical optimization schemes available to optimize their design, while experimental trial and error is far too time consuming.

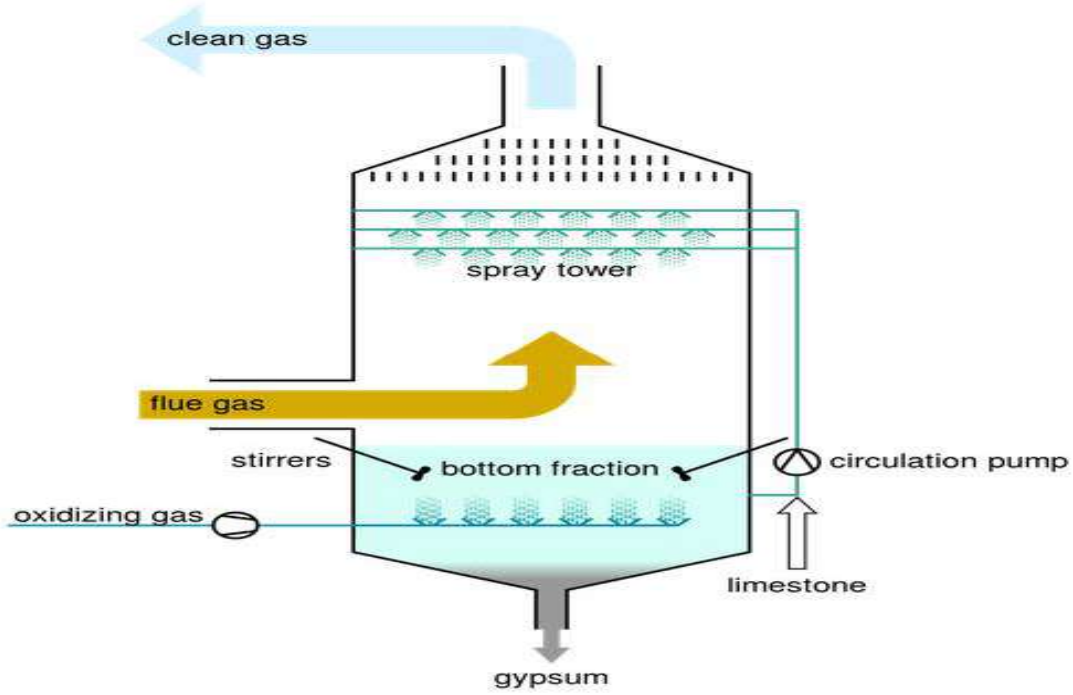


V.S. KAMALESH

IV AE

Modified Emission Control system by Wet Scrubber Technique for IC engine

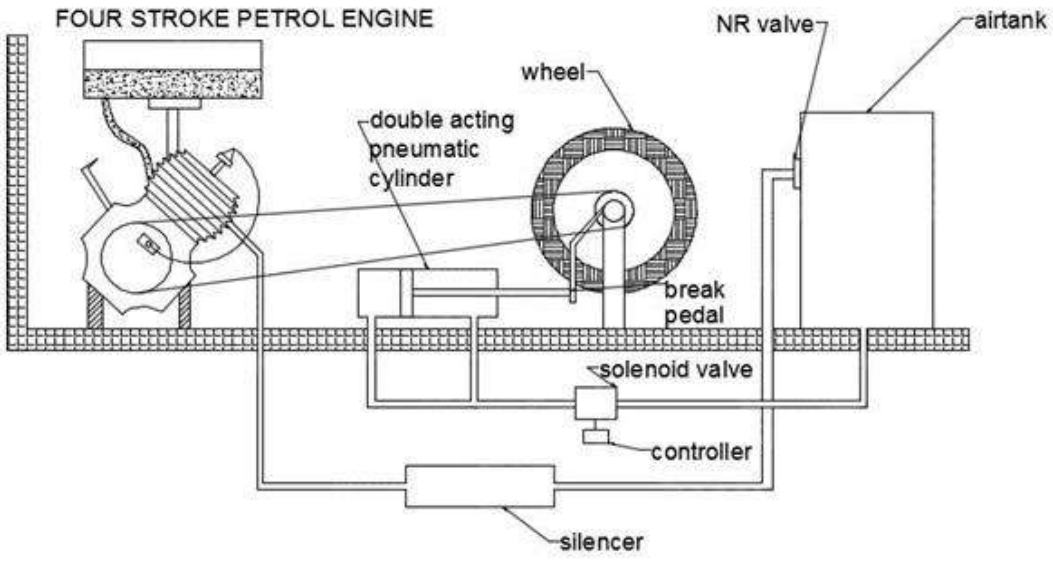
Wet Scrubbers are air pollution control devices for removing particles and gases from automobile vehicle exhaust gases. It is operated by introducing the dirty exhaust gas with a scrubbing liquid as water. Then gases are collected in the scrubbing liquid. Wet scrubbers are usually the most appropriate air pollution control device for collecting both, particulate and gas in a single system alone. Its help of control the air pollution. Wet scrubbers are devices that remove pollutants from exhaust gas. The goal in absorption and wet scrubbing equipment is the removal of gases and particulate matter from an exhaust gas by causing the gaseous contamination to become dissolved into the liquid gas and the solids to be entrained in the liquid. Low-risk processing of incendiary gases Ability to handle high- temperature, high-humidity gas without temperature limit or condensation problems. Wet scrubbers are a special device used to remove a variety of pollutants from exhaust gas from furnaces or other devices. These devices use a scrubbing liquid to remove the pollutants. The exhaust gas is moved through the scrubbing liquid (usually through a chamber) and the liquid is misted through the gas. The liquid most commonly used is water. A wet scrubber's particulate collection efficiency is directly related to the amount of energy expended in contacting the gas stream with the scrubber liquid.



SANJEEVI S
III AE

Development of Air Brake System and Power Generation Using Engine Exhaust Gas

A brake is a mechanical device that inhibits motion by absorbing energy from a moving system. It is used for slowing or stopping a moving vehicle, wheel, axle, or to prevent its motion, most often accomplished by means of friction. The air compressor compresses the atmospheric air and it stored in the air tank and the air tank has pressure relief valve to control the pressure in the tank. The air tank supplies the compressed pneumatic power to the pneumatic actuator through solenoid valve to apply brake. The pneumatic actuator is a double acting cylinder which coverts pneumatic pressure into linear motion The focus of this project is to review the latest development and technologies on waste heat recovery of exhaust gas from internal combustion engines. The exhaust gases are filtered and the pure form of gas is stored in an air tank which in turn can be used for actuating the pneumatic cylinder which results in applying the brakes. With the development of highways, logistics and the pace of life, weight and velocity of vehicles has become more and larger, which has reduced the safety of driving. The braking load of vehicles increases quickly so that the primary brake system is easily overloaded and can be damaged by overheating. The other main advantage of this project is that separate air tank for the pneumatic brakes are not needed. The air exhausted from the engine is stored in a tank and later is used up for applying the brakes

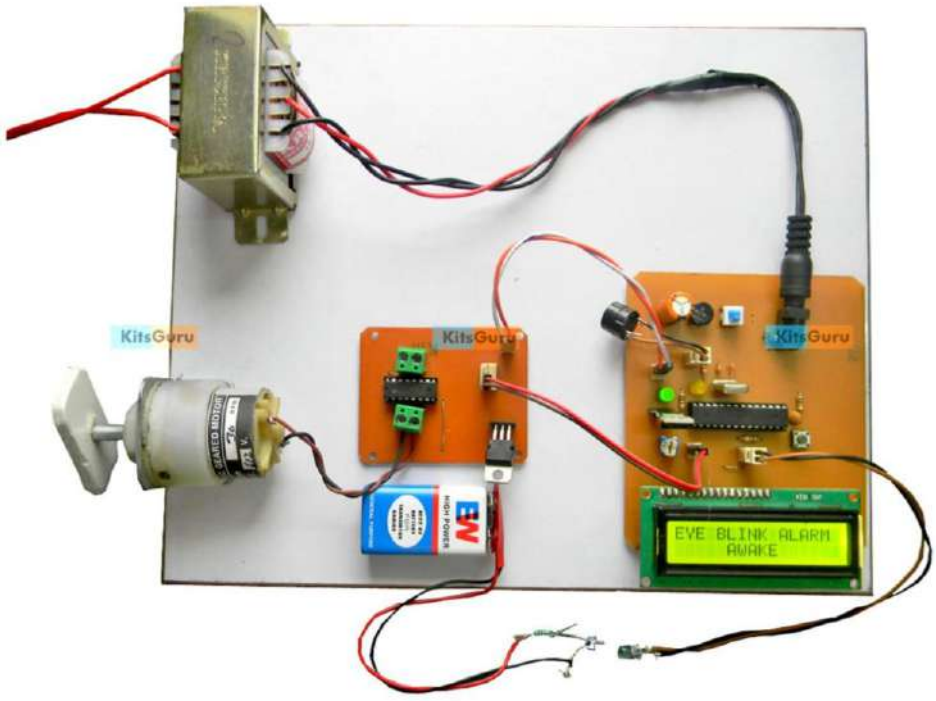


SREEKARAN M V
III AE

Automatic Emergency Braking system using eye blink sensor

An Accident Prevention System which helps in preventing/avoiding accidents. Accident due to cause of drowsy is prevented and controlled when the vehicle is out of control. The accidents due to the drowsy state of the driver is prevented using automatic breaking system by using eye blink sensor. The term used here for the realization that the driver is drowsy is by using eye blink sensor of the driver. But the life lost once cannot be re- winded. Advanced technology over's some hope to avoid these up to some extent. It involves measure and controls the eye blinking using IR sensor. The IR transmitter is used to transmit the infrared rays in our eye. The IR receiver is used to receive the reacted infrared rays of eye.

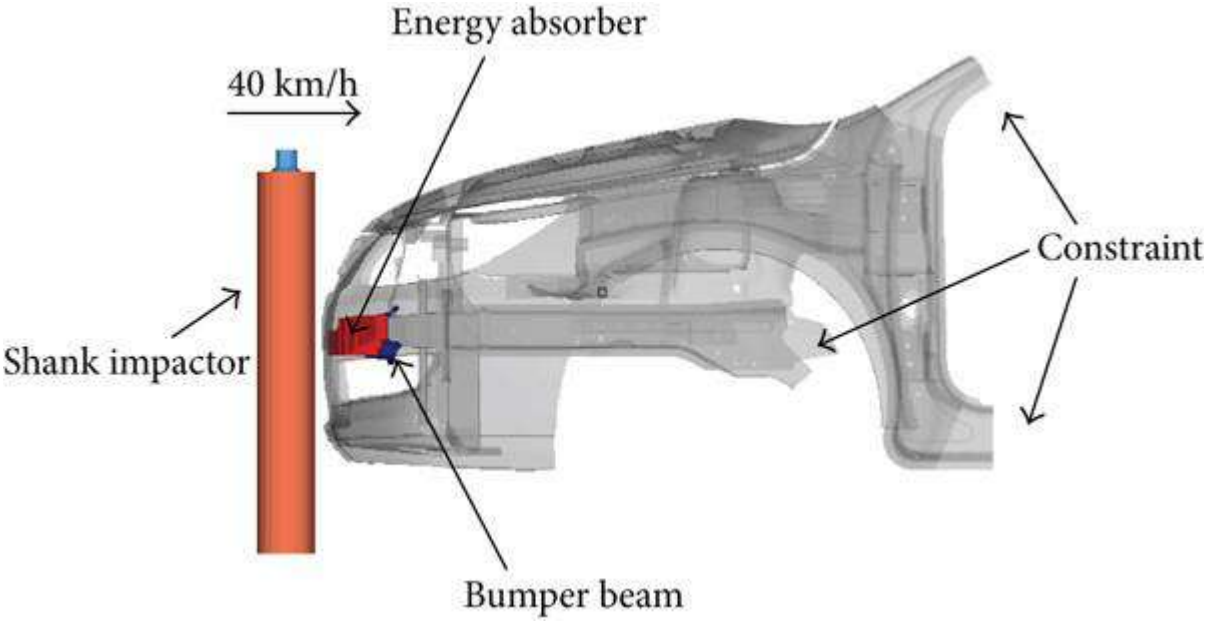
In recent times drowsiness is one of the major problem of highway accidents. These types of accidents occurred caused by drowsy and driver can't able to control the vehicle, when the driver wakes. The drowsiness is indented by the eye blink closure and blinking frequency through infrared sensor worn by driver by means of spectacles frame or IRS. If the driver is drowsy, then the system will give buzzer and the speed of the vehicle is reduced in 3 to 5 sec



GOWDHAM SUNDAR A
III AE

Carbon Fiber 300–Kevlar Hybrid Composite Bumper for Enhanced Impact Resistance in Automobiles

The safety of the vehicle is an important design consideration. The safety of the vehicle can be improved significantly by properly designing the bumper, which will protect against sudden collision. The majority of studies on polymer composite bumpers have focused on single-fiber reinforcement; hybrid composites are known to provide better performance than single reinforcement. This research utilises carbon fibre, along with Kevlar fibre, for the fabrication of a bumper. The model was simulated for crashworthiness by finite element analysis. Experimental results reveal that the CF 300-Kevlar composite bumper outperforms conventional single-fibre composite bumpers in terms of structural integrity, impact energy absorption, and deformation. Finite element analysis (FEA) simulations corroborated the experimental findings, demonstrating that hybrid reinforcement effectively optimizes crash performance. The CF 300-Kevlar hybrid composite bumper has several advantages over traditional metal and single-fibre composite bumpers, including being eco-friendlier, lightweight, and durable.



HARISH C
II AE

****


K.S.R. COLLEGE OF ENGINEERING
TIRUCHENGODE, INDIA
WHERE FUTURE BEGINS