

Wheels of Innovation

AUTOMOBILE ENGINEERING DEPARTMENT MAGAZINE

VOLUME 2

2024-25 ACADEMIC YEAR





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WHEELS OF INNOVATION

2024-25 ACADEMIC YEAR

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ABOUT THE DEPARTMENT

Established in 2004, our Department of Automobile Engineering is not just about traditional learning. We immerse our students in the latest trends through seminars, workshops, and interactions with industry experts. With a robust UG program welcoming aspiring engineers each year, we ensure you're not just academically sound but industry-ready. Our value-added courses each semester bridge the academic-industry gap, empowering you to undertake core domain projects. Dive into hands-on experiences in our expansive 5000 sq. ft Automobile Lab, equipped for all your innovative endeavours. And it's not just about studies; our associations 'SAEIndia Collegiate club of SCMS' & 'TORQUE' offer platforms for you to organize and participate in riveting technical events. Join us, and find yourself in esteemed companies like Mahindra, JK Tyres, TVS, and Bosch after graduation.

VISION & MISSION

VISION

To be a centre of excellence in disseminating knowledge in the automobile engineering domain.

MISSION

Provide automobile related education of exceptional quality to students by inculcating a thirst for knowledge through adequate practical exposure and classroom sessions.



Engineering tomorrow, driving today

MESSAGE FROM THE HOD



Welcome to the latest edition of Wheels of Innovation, our departmental magazine that continually captures the boundless energy, technical curiosity, and creative pulse of the Department of Automobile Engineering.

As the automotive industry undergoes its most radical transformation in a century—pivoting toward artificial intelligence, software-defined ecosystems, and sustainable mobility—our students and faculty remain at the forefront of this exciting evolution. This magazine stands as a testament to that journey, beautifully blending rigorous academic inquiry with real-world application.

Within these pages, you will find a diverse tapestry of thought and talent. From deep-dive technical explorations into Artificial Intelligence & In-Car Digital Ecosystems and exterior lighting interactions, to comprehensive vehicle evaluations like our Honda Elevate review, the content reflects our commitment to industry readiness. Furthermore, stories of student ingenuity—such as building custom EV scooters and participating in competitive collegiate clubs—showcase the hands-on spirit that defines our workshops and laboratories.

Engineering is as much about human passion as it is about machines. Through inspiring student narratives, creative fiction, poetry, and reflective travelogues spanning from coast to clouds, this publication celebrates the engineers behind the innovations. I extend my heartfelt appreciation to the editorial team, faculty coordinators, and all our student contributors whose dedication brought this magazine to life. May these pages inspire you to question, create, and drive the future forward.

Dr. Jenson Joseph E.

Professor & Head of the Department
Department of Automobile Engineering
SCMS School of Engineering & Technology



Wheels of Innovation

Welcome to Wheels of Innovation, the official magazine of the Department of Automobile Engineering. As we reflect on an extraordinary period of exploration, this issue captures the heartbeat of modern mobility and engineering passion.

The automotive landscape is undergoing a massive shift toward a sustainable, intelligent, and software-defined future. Throughout this edition, we bridge rigorous academic theory with real-world industrial evolution.

Our technical features dive into Next-Generation Advanced Driver Assistance Systems (Level 2+ ADAS), exploring how surround radars and domain controllers create a protective electronic cocoon. We also examine the structural blueprint of EV Skateboard platforms, illuminating how modular layouts and advanced battery packs reshape sustainable mobility.

Engineering is equally about community and spirit. This edition highlights our vibrant campus ecosystem through reports on the high-energy TORQUE & iCREATE Spark EV Innovation Challenge and the intellectual rigor of the SAEIndia Collegiate Club Tier I Auto Quiz.

Beyond the labs, join us on an eco-conscious expedition through the high ranges of Wagamon, Peermed, and Kuttikkanam in an electric SUV, proving technology and nature can coexist. Finally, we explore the emotional core of our fascination with machines—from the mechanical heartbeat in "The Iron Pulse" to the touching human narrative in "The Last Gear."

Turn the key and enjoy the journey.

Mr. Aswin Saud

2021-25 Batch

Chief Editor

Department of Automobile Engineering

SCMS School of Engineering & Technology

EDITORIAL

An Electric Start

The Story Behind Our Home-Built EV Scooter

The budding engineers of Team Atom United from SSET built their own electric two-wheeler and took it to the National EV Challenge – living out their dream in the process.

It didn't begin with the whirr of an electric motor. It began with an idea – one that had lost its spark, its promise dimmed until it became little more than a half-forgotten joke. Then, a handful of engineering students from SSET, calling themselves “The Crew”, decided to bring it back to life.

Their goal was bold: to build an electric two-wheeler from scratch and take it to the National EV Challenge. Thus was born Team Atom United.

The Crew

The Crew began as a group of misfits – no name, no plan, just big dreams. Slowly, others joined in – students who brought fresh skills, energy, and the kind of laughter that keeps fatigue at bay. With every new member, the spark began to glow again. Soon, our workspace wasn't just about design precision or fabrication details; it became a place for late-night chai breaks, debates, and quiet perseverance when things went wrong.

Then came the Diploma students. They didn't just fill gaps – they brought direction and discipline. Their clarity of thought and commitment helped transform our scattered efforts into a cohesive force. Under their steady hands, The Crew found its rhythm, and the dream took shape.



The Pit Crew

To streamline work, the Pit Crew was formed – a set of dedicated teams working in harmony toward one goal.

The Design Team, led by Krishnapriya, Advait Deepu, and David Thomas, turned imagination into blueprints. The Fabrication Team, comprising Clement G. N., Aravind A., and Ashwin S. K., transformed those blueprints into steel and motion. Aesthetics had made sure every surface was polished with precision.

The Finance and Sponsorship Team, led by Nived Babu, Suhail K., and Eshan Navas, handled the numbers, networks, and negotiations that kept the project afloat. Together, they formed the backbone of the Pit Crew's success.

At first, the project existed only on laptop screens – a collection of lines and curves in CAD models, blueprints alive only in imagination. Hours blurred into nights as we debated tolerances, recalculated weights, and reimagined redesigns.

Then came the workshop – sparks flying, steel clanging, grease-stained hands working late into the night. What began as code and calculation turned into the smell of metal, the sound of progress, and the joy of creation.

“We aren’t just building a scooter – we are building opportunities for everyone.”
— Clement G. N.

Sigh of Relief

When the scooter finally rolled out before the college – complete, functional, and gleaming – disbelief turned into pride. The machine that once existed only in sketches now stood as proof of every late night and every near-disaster we’d survived. As the covers came off, Enzo Ferrari’s words rang true: “If you can dream it, you can do it.”

For us, that first drive wasn’t just the start of a machine – it was the moment we realized that all you really need is a dream, a few tools, and a stubborn refusal to give up.

All This for What?

At the National EV Challenge, we didn’t come first. We didn’t come second. In fact, we weren’t anywhere near the top – but we weren’t last either.

And that, in itself, was victory.

In a single week, we built something real, something that worked, and something that taught us more than any classroom ever could. We spoke to seniors, brainstormed with vendors, solved problems we didn’t know existed, and discovered how far grit can take you.

“Classrooms are only 40% of an engineer’s college journey; the other 60% is beyond the doors,” said Dr. Joseph, our mentor.

We may not have brought home a trophy, but we brought home something better – experience, friendships, and belief. What began as a lost spark became proof that even a flicker, shared among dreamers, can light the way forward.

The Roadblocks

And then came the challenges. Parts delayed. Components that wouldn't fit. Budgets stretched thin. Deadlines closing in like storm clouds. There were nights when we thought it was over. But one more time, and another, and every single time, said Ashwin. Their faculty advisor, Koshy P. Joseph, encouraged us by saying, "Tomorrow is shaped by those who are still ready to put in the hard work." It changed us. Every setback forced us to adapt, rethink, and keep going.

The Cost of a Dream

Electric vehicles don't come cheap. Motors, batteries, and materials stretched far beyond what our student budget could handle. Without sponsors in the early stages, we decided to finance the project ourselves. It was tough – but it taught us the true cost of a dream.

Giving up was never an option. We learned that sometimes, you have to carry the weight first to prove that your dream is worth believing in. The next time, we'll walk in better prepared – and perhaps, with sponsors who believe in us too.

"We aren't just building an Electric Scooter – we are building opportunities for everyone else," said Clement, looking at the bigger picture.

Mr. Eshan Bava Navas

2023-27 Batch AU



From Coast to Clouds

A Suzuki Jimny's journey from the streets of Kochi to the mountains of Munnar

A travelogue usually tells us about a destination. An automobile travelogue tells us what it takes to get there.

Our destination is Munnar, but the real subject of this journey is the Suzuki Jimny. From the traffic-filled streets of Kochi to the winding roads and rough surfaces of the Western Ghats, the journey offers a chance to experience how the same vehicle behaves as the terrain changes beneath its wheels.

THE CITY — WHERE SIZE MATTERS

The journey begins in Kochi, where traffic is the first obstacle.

Here, the Jimny's compact dimensions immediately become useful. Narrow lanes, crowded junctions and limited parking spaces are easier to negotiate in a vehicle designed with a relatively small footprint. Its upright seating position provides a commanding view of the road, while the squared-off body makes it easier to judge the vehicle's corners.

At low speeds, the light controls and compact proportions make the Jimny feel at home in the city.

But Kochi is only the beginning.

THE HIGHWAY — LEAVING THE CITY BEHIND

As the traffic becomes lighter and the road opens up, the character of the Jimny changes. The 1.5-litre petrol engine has to work harder to maintain highway speeds, particularly when overtaking or carrying passengers and luggage. This makes planning ahead more important than it would be in a larger, more powerful SUV.

The highway also reveals another side of the Jimny. Its tall, upright shape and short wheelbase make it feel distinctly different from a conventional hatchback or crossover. At cruising speeds, wind noise becomes more noticeable, reminding the occupants that this vehicle was designed with ruggedness and off-road capability high on its priority list.

After several hours, however, the road begins to rise



THE GHATS — WHERE THE JIMNY STARTS TO MAKE SENSE

The approach to Munnar brings a dramatic change in terrain.

Long stretches of highway are replaced by steep gradients, hairpin bends and uneven surfaces. The engine and gearbox now have to deal with repeated climbs and descents rather than maintaining a constant speed.

The Jimny's compact dimensions become useful again. On narrow mountain roads, its relatively small footprint makes negotiating tight bends less intimidating.

The upright driving position also provides excellent visibility through corners, while the short wheelbase helps the vehicle change direction easily.

When the road beneath it changes.

Descending the hills brings another important test: engine braking and brake control. On long downhill sections, using the correct gear can reduce the need for continuous braking and help maintain better control.

BEYOND THE TARMAC

The final part of the journey takes us away from smooth mountain roads and onto rougher surfaces.

This is where the Jimny's engineering becomes the focus.

Its ladder-frame chassis, high ground clearance, solid-axle suspension arrangement and four-wheel-drive system are designed for precisely this type of environment. Uneven surfaces that would require careful negotiation in a conventional road car can be approached with greater confidence.

The important difference isn't simply speed. It is control.

The suspension has to absorb changes in the road surface while keeping the tyres in contact with the ground. Ground clearance becomes important when crossing stones, ruts and uneven sections, while four-wheel drive can provide additional traction when the surface becomes loose. The Jimny doesn't suddenly become a different vehicle when the road ends. Instead, the characteristics that may seem unusual on a highway begin to make much more sense.

AT THE TOP

By the time the Jimny reaches the higher elevations around Munnar, the journey has taken it through four very different environments.

In Kochi, its compact size was its advantage.

On the highway, its limitations became apparent.

On mountain roads, its visibility, manoeuvrability and compact dimensions became useful again.

And on rough surfaces, its off-road hardware finally had an opportunity to demonstrate why it exists.

That is perhaps the most interesting thing about travelling by car.

A specification sheet can tell us that a vehicle has four-wheel drive, high ground clearance or a particular suspension design. But it takes a journey across different terrain to understand why those features matter.

The road from Kochi to Munnar is therefore more than a route between two places.

It is a gradual transition from urban practicality to mountain capability—and a reminder that every car reveals a little more of its personality when the road beneath it changes.

Mr. Mohamed Sajas P. S.
2023-27 Batch AU



Currents of Hope

The afternoon sun beat down mercilessly on the dusty courtyard of the old lower primary school in Angamaly, baking the red clay until it cracked. Inside one of the high-ceilinged classrooms, ten-year-old Abhijith sat staring blankly at the blackboard, though his mind was miles away, anchored entirely to the heavy, canvas schoolbag resting against his desk. Inside that bag lay a crumpled, moisture-stained envelope—a final fee reminder from the school office, carrying a red-inked warning that tomorrow would be the absolute last day to clear his overdue tuition.

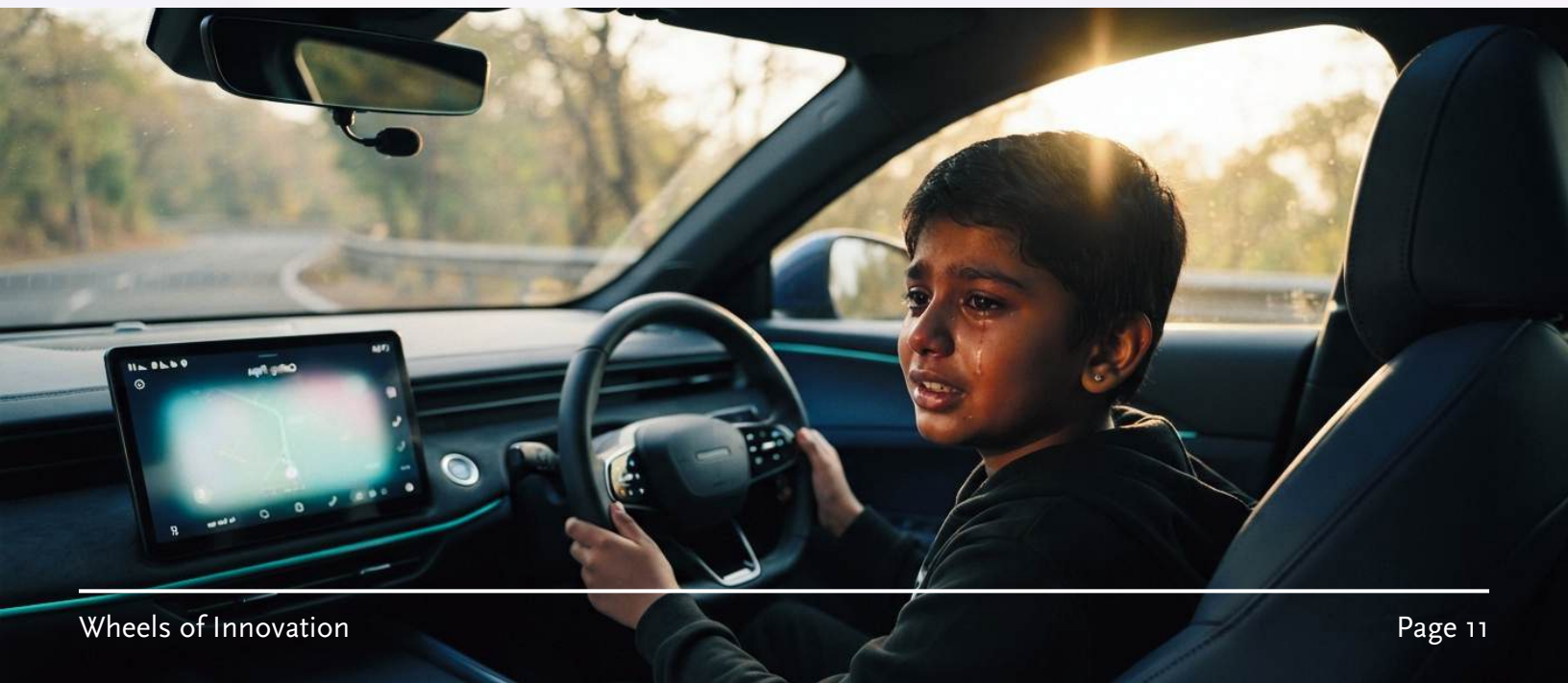
Abhijith's father, a quiet, hardworking auto-rickshaw mechanic, had been confined to bed for three weeks following a sudden bout of severe jaundice. The small income they relied on had abruptly dried up, replaced by the relentless ticking of medical bills and pharmacy credits. All morning, a suffocating knot of anxiety had tightened in the boy's chest. He couldn't bring himself to look at his teachers, nor could he join his friends on the playground when the bell rang for the lunch break.

Instead, Abhijith slipped out through the side gate of the school compound, seeking a quiet place to hide away from the noise and his own mounting panic.

His feet carried him toward the edge of the town, near the sprawling parking lot adjacent to the local railway station where commuters often left their vehicles. Among the standard array of hatchbacks and sedans parked under the shade of a massive ancestral mango tree sat a peculiar, striking machine. It was a brand-new, deep indigo-blue electric vehicle—a sleek, futuristic crossover with flush door handles, aerodynamic alloy wheels, and a solid glass roof that shimmered under the shifting leaf-shadows. It belonged to an uncle who worked in Kochi, a software engineer who had driven it up to Angamaly for a brief family visit and parked it there while attending a local function.

Abhijith had admired the car from afar days ago. It had no traditional chrome grille, no exhaust pipe puffing black smoke, and no loud engine roar. To him, it looked like a spaceship dropped straight into the heart of Kerala's bustling small-town landscape.

Seeking refuge from the sweltering heat and the heavy weight of his thoughts, Abhijith walked slowly toward the vehicle. He didn't expect anything to happen. But as he stepped close to the driver-side door, something extraordinary occurred.



The vehicle's sophisticated proximity sensors recognized the tiny, hesitant heat signature and movement nearby. With a soft, welcoming chime that sounded more like a chord from a harp than a machine, the flush door handles glided outward smoothly, and the matrix LED headlights gave a gentle, rhythmic pulse, as if the car were breathing.

Startled, Abhijith stepped back, his eyes wide. Then, drawn by an unexplainable curiosity, he reached out and pulled the handle. The door swung open effortlessly, revealing a pristine, minimalist cabin bathed in ambient teal lighting, smelling faintly of clean leather and high-tech electronics.

Hesitating for only a second, the boy climbed inside and sank into the remarkably plush, ergonomic driver's seat. The heavy wooden door closed with a solid, reassuring thud that instantly sealed out the chaotic honking of Angamaly's traffic, the dust of the street, and the terrifying echo of the school's red-inked notice.

Inside this silent sanctuary, the central touchscreen console automatically woke to life with a soft graphic greeting: Welcome, Driver.

Abhijith stared at the digital dashboard, mesmerized. Without an engine humming under the hood, the cabin was preternaturally quiet. He rested his small hands on the flat-bottomed steering wheel. For a kid who spent his weekends handing wrenches to his sick father in a grease-stained garage, sitting behind the wheel of a software-defined vehicle felt like stepping into the next century.

On a whim, he tapped the voice-control icon on the steering wheel. A soft, synthetic chime prompted him. Not knowing what else to say, the boy whispered his deepest, most desperate wish into the empty cabin: "Help me... please."

Naturally, a standard car wouldn't understand. But this vehicle ran on an advanced, cloud-connected operating system equipped with ambient speech processing and contextual smart routines. While it couldn't magically generate money, its onboard digital assistant—programmed to analyze cabin audio inputs and stress-detection tones through interior biometric sensors—immediately processed the vocal tremors and keywords.

A calm, gentle female voice chimed from the surround-sound speakers: "Stress levels detected. Activating relaxation environment. Connecting to local saved contacts."

Before Abhijith could panic, the car's high-definition center screen didn't open a game or a map; instead, it automatically initiated an encrypted Bluetooth handoff to his father's smartphone, which had been paired to the car's system during a family trip a week prior.

A loud, clear ringing tone echoed through the premium audio system.

Abhijith froze, his heart leaping into his throat. He reached out frantically to cut the call, but before his finger could touch the screen, the call connected.

"Hello?" came his father's weak, raspy voice through the cabin speakers, sounding tinny and distant from the small bedroom back home. "Abhi? Is that you, beta? Why are you calling from this number? Are you okay?"

Tears, long held back, finally spilled over Abhijith's eyelashes. He buried his face in his hands, his shoulders shaking as he sobbed into the quiet leather interior. "Appa... I'm scared. The school gave me the final warning for the fees. If I don't pay tomorrow, they said... they said I can't write the exams. And you're sick, and we have no money..."

Silence stretched across the line for a long, agonizing moment. In the quiet bedroom in Angamaly, Ramesh clutched his old smartphone tighter against his ear, feeling a crushing wave of helplessness wash over him. A father who couldn't protect his child's education was a broken man.

"Listen to me, mon," Ramesh whispered fiercely, his voice cracking with emotion, masking his own despair to comfort his son. "Look at me—well, listen to me. Your father is still here. I might be stuck in this bed right now, but I haven't given up. Come home straight from school. We will figure this out. I promise you, education is one thing we never compromise on. Don't cry, my boy. Come home."

"Okay, Appa," Abhijith choked out, wiping his eyes with his uniform sleeve.

"Good boy. Now hurry back home. I love you."

The call disconnected with a soft beep.

Abhijith sat alone in the silent, illuminated cabin for a long time, letting the words settle into his bones. The crushing panic in his chest had shifted, replaced by a stubborn, quiet resolve. The car's ambient lights slowly transitioned from a cool blue to a warm, comforting amber, as if sensing his emotional stabilization.

He unbuckled himself, opened the door, and stepped back out into the Angamaly sun. The heat was still there, and the dust was still swirling, but the world looked entirely different.

When he reached home ten minutes later, he found his father sitting upright on the edge of the cot, wrapped in a blanket, looking pale but determined. On the bedside table lay an old, heavy wooden box—the family's emergency reserve, containing a few silver coins, a vintage pocket watch, and a small gold chain belonging to his mother.

His father looked up, smiled weakly, and held out the box. "Take these to the cooperative bank near the municipal office, beta. Talk to my friend Kurien uncle. Tell him it's collateral for a short-term emergency loan. We will clear your fees before the school bell rings tomorrow."

Abhijith took the box, feeling its weight. He looked at his father's tired, resolute eyes and nodded firmly.

He didn't mention the strange, futuristic electric car parked down by the railway station that had given him the voice to speak his fears out loud. But as he walked out the door toward the bank, striding with a new sense of purpose under the fading afternoon sky of Angamaly, he knew one thing for certain: sometimes, help arrives in the most unexpected places—whether it is found in the quiet corners of a high-tech cabin, or in the unyielding heart of a father who refuses to let his child fall.

Mr. Ben Abraham
2024-28 Batch AU

Artificial Intelligence & In-Car Digital Ecosystems: The Cognitive Cabin

The modern automobile has evolved far beyond a mechanical conveyance of metal, rubber, and internal combustion. Today's vehicle is a sophisticated, rolling computing node—a software-defined living space where artificial intelligence and cloud-connected digital ecosystems dictate the driving experience. As automakers pivot toward software-driven architectures, the cockpit has transformed from a static dashboard of analog dials into an adaptive, context-aware digital companion.

The Shift to Software-Defined Cockpits

For decades, vehicle electronics were fragmented across dozens of discrete electronic control units (ECUs), each managing a single localized function. The modern approach, championed by next-generation electronic-electrical (E/E) architectures, consolidates these workloads into centralized domain controllers.

This centralization allows the infotainment system and digital instrument cluster to operate as a unified ecosystem. Powered by high-throughput automotive system-on-chips (SoCs), modern vehicles process millions of lines of code in real time, enabling seamless over-the-air (OTA) updates that continuously refine vehicle behavior, user interfaces, and digital feature sets long after the car has left the showroom floor.

Generative AI and Conversational Interfaces

Early automotive voice control systems were notoriously rigid, requiring exact syntax and pre-programmed commands that often frustrated drivers. The integration of advanced machine learning and Generative AI assistants has completely rewritten this paradigm.

- **Contextual Comprehension:** Modern cabin assistants understand natural, conversational human speech, enabling occupants to speak fluidly without memorizing specific prompts.
- **Proactive Adjustments:** By analyzing historical preferences, driving patterns, and real-time biometric inputs, AI systems can autonomously adjust climate controls, seating positions, route guidance, and ambient lighting to suit individual preferences.
- **Natural Dialogues:** Drivers can query complex travel questions, request restaurant recommendations along a route, or adjust vehicle settings using dynamic, human-like back-and-forth dialogue.

Natively Integrated Ecosystems

A defining hallmark of current in-car digital ecosystems is the deep, native integration of smartphone-grade software platforms directly into the vehicle's hardware stack. Rather than relying solely on screen-mirroring protocols, platforms like Google built-in embed core digital services straight into the vehicle's central operating system.

This deep integration yields major functional advantages:

1. **Seamless Navigation:** Maps and traffic data operate natively on the vehicle's hardware, cross-referencing real-time battery status or fuel levels to automatically suggest optimal charging or fueling stops along complex routes.
2. **Unified Hands-Free Control:** Drivers can dictate text messages, manage schedules, and control media playback using secure, embedded voice recognition without diverting their gaze from the road.
3. **Third-Party App Extensibility:** App stores tailored specifically for the automotive environment allow users to download navigation utilities, streaming services, and productivity tools right to the dashboard.



Balancing Digital Immersion with Road Safety

While the influx of artificial intelligence and expansive touch displays enriches the in-car experience, it introduces critical human-machine interface (HMI) challenges. Automakers and engineers are tasked with preventing digital overload.

To combat driver distraction, modern ecosystems leverage cabin-facing infrared cameras and capacitive steering wheel sensors. These systems monitor driver alertness and gaze orientation, ensuring that complex AI interactions or visual alerts do not compromise active driving safety. When a high-workload driving scenario is detected, the digital assistant dynamically filters out non-essential notifications, streamlining information to what is strictly necessary for vehicle control.

The Road Ahead

The convergence of artificial intelligence and digital ecosystems is laying the groundwork for a deeply personalized mobility experience. As edge-computing capabilities expand and neural processing units become standard equipment in automotive silicon, the car is no longer just a tool to get from point A to point B. It is an intelligent, learning partner that adapts to its occupants, turning every journey into a connected, intuitive, and secure experience.

Mr. Pranav Jomon Mani
2022-26 Batch AU

Honda Elevate: Comprehensive Car Review

The Honda Elevate enters the fiercely competitive mid-size SUV segment with a clear mission: to bring Honda's legendary reputation for reliability, spacious packaging, and refined driving dynamics to a market dominated by feature-heavy rivals. Positioned as a global mid-size SUV developed with a strong focus on everyday usability, the 2024 model balances rugged aesthetics with practical engineering.

Design and Exterior Styling

The Elevate departs from soft, coupe-like crossovers by embracing a bold, upright stance.

- **Front Fascia:** It features a large, dominant rectangular grille flanked by sharp, slim LED headlamps that give it a confident road presence.
- **Proportions:** High ground clearance (220 mm) and squared-off wheel arches provide a muscular profile, while distinct character lines run cleanly along the length of the body.
- **Rear Profile:** Connected-style tail lamps and a faux skid plate accentuate its wide stance and SUV credentials.

Interior Comfort, Cabin Space, and Practicality

True to Honda's "Man Maximum, Machine Minimum" philosophy, the interior packaging is one of the vehicle's strongest selling points.

- **Cabin Layout:** The dashboard features a clean, horizontal layout with a floating touchscreen infotainment system and physical toggles for climate controls.
- **Space and Seating:** Cabin room is exceptionally generous. Headroom and legroom in the rear row easily accommodate taller adults, making it an ideal family carrier.
- **Cargo Capacity:** It offers a massive class-leading boot space (around 458 liters), making long road trips and airport luggage runs effortless.



Performance and Powertrain Dynamics

The 2024 Honda Elevate relies on a proven mechanical foundation.

- **Engine:** Powered by a 1.5-liter i-VTEC petrol engine (delivering around 121 PS and 145 Nm of torque), paired with either a 6-speed manual transmission or a smooth 7-speed CVT.
- **Drive Experience:** The engine is linear, refined, and loves to rev. Power delivery is smooth rather than aggressive, making city commutes stress-free and highway cruising relaxed.
- **Ride and Handling:** The suspension is tuned on the firmer side of comfortable, which translates to high-speed stability and minimal body roll on winding roads while safely absorbing minor road imperfections.

Technology and Safety Features

While it may not lean as heavily into flashy digital gimmicks as some competitors, the Elevate covers all essential technology and safety bases.

- **Infotainment:** A responsive touchscreen interface featuring wireless Apple CarPlay and Android Auto connectivity.
- **Driver Aids:** Higher trims include Honda Sensing (ADAS suite) featuring collision mitigation braking, lane keep assist, adaptive cruise control, and lead car departure notification.
- **Standard Safety:** Equipped with multiple airbags, ABS with EBD, vehicle stability assist, and rear parking sensors across variants.

Verdict

The 2024 Honda Elevate is a no-nonsense, highly competent mid-size SUV. It doesn't rely on turbocharged gimmicks or overly complex digital interiors; instead, it focuses on what matters most: bulletproof mechanical reliability, stellar packaging, comfortable ride dynamics, and a commanding driving position. For buyers looking for a dependable, spacious, and honest daily driver that handles both city traffic and weekend road trips with ease, the Elevate remains a compelling choice.

Mr. Anoop M. S.

Assistant Professor
Department of Automobile Engineering

Lighting and Exterior Interaction: The Evolution of Automotive Illumination

Automotive exterior lighting has undergone a radical transformation, evolving from simple functional illumination into a sophisticated medium for communication, safety, and dynamic design. In modern vehicle architectures, exterior lighting systems do more than just pierce through darkness—they act as active communication interfaces between the vehicle, pedestrians, and surrounding motorists.

The Shift from Static Illumination to Digital Canvas

For decades, headlights and taillights were static mechanical assemblies governed by fixed reflectors and halogen or early-generation LED bulbs. Today, advanced semiconductor technologies and software-defined electronics have turned exterior lighting into a programmable digital canvas.

- **High-Resolution Matrix LED Headlights:** Modern front-lighting systems feature thousands of individually controllable micro-LED pixels. These systems can project high-definition guidance lines, warning symbols, or pedestrian crosswalk highlights directly onto the road ahead.
- **Anti-Glare Adaptive Driving Beams:** By utilizing forward-facing optical cameras, these intelligent headlamps continuously track oncoming traffic and vehicles ahead, selectively dimming individual pixels to maintain high-beam visibility without blinding other drivers.

Digital OLED Rear Lighting and Car-to-Car Communication

The rear of the vehicle has similarly become an active safety and communication zone. The introduction of digital OLED (Organic Light-Emitting Diode) rear lighting has revolutionized how cars signal their intentions to trailing traffic.

1. **Customizable Light Signatures:** Owners can personalize their vehicle's lighting profiles via infotainment settings, choosing from distinct geometric patterns and dynamic welcome/farewell animations.
2. **Proximity Warning Indicators:** Advanced digital OLED panels can alter their layout dynamically when an approaching vehicle gets too close from behind while stopped, flashing warning patterns to alert distracted drivers and mitigate rear-end collisions.
3. **Hazard Projection:** Certain advanced prototypes and production integrations can project warning triangles or low-traction symbols onto the road surface through the taillight cluster to warn trailing motorists of sudden braking or road hazards ahead.

Sensor Integration and Facia Illumination

As autonomous driving sensors and surround-radar arrays become standard equipment, exterior lighting elements are increasingly integrated with sensor hardware.

- **Hidden-until-Lit Grilles:** Front grilles and decorative panels incorporate transparent polycarbonate surfaces backed by patterned LEDs. These panels remain sleek and opaque when the vehicle is parked, but illuminate dynamically to welcome the driver or communicate status updates regarding charging and automated driving modes.

- **Seamless Radar and Camera Integration:** Illumination housings are engineered to house flush-mounted LiDAR, ultrasonic sensors, and wide-angle cameras without compromising optical clarity or aesthetic appeal, ensuring that active safety sensors maintain an unobstructed view of the surroundings.

Power-Operated Exterior Doors and Proximity Interaction

Complementing exterior lighting advancements, modern vehicle design heavily emphasizes exterior physical interaction. Flagship luxury and family platforms feature power-operated exterior doors driven by sensor networks.

When a driver approaches with a digital key or smartphone credential, exterior ground-projection lights illuminate a "welcome mat" on the pavement while flush door handles glide outward smoothly. Proximity sensors ensure that doors open only when side-radar systems confirm the path is clear of passing cyclists, pedestrians, or adjacent vehicles, preventing door-ding accidents in tight parking environments.

The Future of Exterior Interaction

The convergence of advanced lighting, exterior sensors, and software-defined architectures is redefining the emotional and functional bond between vehicles and their environment. Exterior lighting is no longer a passive accessory; it is an active, communicative language that enhances situational awareness, pedestrian safety, and automotive styling for the next generation of mobility.

Mr. Aswin K. Ajesh
2024-28 Batch AU



Powering the Future:

The Electric Evolution of The Crew Racing Team

The automotive industry is undergoing a monumental shift toward sustainable energy, and our department is actively participating in this revolution. Our current focus is on the development of a high-performance electric four-wheeler, a project that bridges the gap between theoretical knowledge and practical engineering.

This initiative is not just about building a vehicle; it's a comprehensive exercise in electric mobility, pushing the boundaries of what student engineers can achieve. The project involves rigorous 3D modeling using advanced CAD software to optimize chassis design and aerodynamic efficiency. Our team is deeply involved in finite element analysis (FEA) to ensure structural integrity while minimizing weight—a crucial factor in electric vehicle performance.

At the heart of our four-wheeler is a carefully engineered powertrain. We are focusing on optimizing motor architecture, whether exploring the nuances of BLDC or PMDC systems, and developing a robust Battery Management System (BMS). The transition from understanding lithium-ion cell construction to implementing high-voltage charging solutions is a practical challenge that prepares us for the demands of the modern automotive industry.

Our previous experiences, including the fabrication of electric scooter prototypes, have provided a strong foundation in component sourcing, suspension design, and overall vehicle assembly. Now, we are scaling up these skills. The engineering process requires a multidisciplinary approach, combining mechanical design, automotive electronics, and strategic project management.

This electric four-wheeler is more than a departmental project; it is a stepping stone toward competitive engineering challenges. By integrating traditional automotive principles with cutting-edge EV technology, we are preparing ourselves to contribute meaningfully to the future of transportation. We are turning concepts into reality, one circuit and weld at a time.



Crack-The-Track:

RC Car Racing League 2025

The spirit of innovation and competition came alive at SCMS School of Engineering and Technology, Karukutty, with the exciting RC Car Racing League 2025, organized by The Crew SSET. Bringing together passionate racers and automobile enthusiasts, the event featured five teams and twenty racers battling it out on the track for the championship title.

Held on 24 May 2025, the competition showcased not only speed and control, but also teamwork, strategy, and engineering creativity. The roaring RC cars, intense races, and energetic atmosphere made the event a thrilling experience for participants and spectators alike.

The event successfully created a platform for students to explore their interest in motorsports and hands-on engineering beyond the classroom. With strong support from organizers and sponsors, the RC Car Racing League stood out as a celebration of passion, innovation, and competitive spirit at SSET.



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SAEIndia Collegiate Club Of SCMS - Steering The Revolution In Automobile Engineering

At the heart of SCMS lies the SAEINDIA Collegiate Club, a beacon of innovation and excellence in the automotive world. Established with a vision, our club is not just about imparting knowledge; it's about igniting passion. We're here to shape the next generation of automotive engineers, offering them a platform where ideas accelerate into reality.

Through immersive hands-on workshops, exhilarating competitive events, and invaluable industry collaborations, we ensure our students are always a gear ahead. For those with a drive to redefine the automotive landscape, our club is the pitstop where your journey begins. Dive in, and let's drive the future, together.



Torque - The Driving Force of Automobile Engineering at SSET

Embark on a transformative journey with TORQUE, the distinguished Automobile Engineering Students' Association at SCMS, Karukutty. As emerging engineers, TORQUE offers you a unique platform to delve deep into the dynamic world of automotive engineering, ensuring you're always at the forefront of innovation. Our association is not just about understanding the mechanics; it's about envisioning the future of mobility. Beyond the technicalities, TORQUE is committed to fostering a community of learners. We introduce you to a spectrum of disciplines, ensuring a well-rounded perspective. Engage in collaborative projects, benefit from hands-on experiences, and connect with industry experts. With TORQUE, you're not just studying engineering; you're living it, ensuring a holistic development tailored for every ambitious student.



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Wheels of Innovation

DEPARTMENT OF AUTOMOBILE ENGINEERING

