

IIT-M flags off e-race car, eyes driverless cars by '25

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Buoyed by the launch of its first electric formula racing car on Monday, the Indian Institute of Madras (IIT Madras) is aiming to roll out driverless race cars by 2025.

The new e-car will be featured in upcoming global student-led formula championships like Formula Bharat in India in January (at the Kari Motor Speedway in Coimbatore) and Formula Student Germany in August 2023. This is for the first time that IIT Madras's Raftar Formula Racing team, which has 45 students as members, is coming out with an electric variant. The institute launches one car every year to be a part of formula-style racing competitions across the world.

Of about 60 teams that are expected to participate in Formula Bharat 2023, around 20 of them may compete with electric cars. An electric car by Raftar costs about ₹60 lakh, while the average combustion vehicle is priced at ₹35 lakh.

"Electric is step one towards an autonomous race car. This year we will be focusing on EV (electric vehicle) reliability, next year we will focus on performance, and in 2025 we want to move to an autonomous or driverless race car," said Karthik Karumanchi, the student team captain.

Built completely by Raftar, the formula car "RF23" is the result of a year-long process in which the team took up design, manufacturing and testing. The Raftar began started working from the campus in 2012.

In terms of performance, the students expect to see sig-



nificant improvements in speed and lap times over the earlier Internal Combustion Engine model due to the higher power delivered by an electric drive. "Our speed is marginally higher than our combustion car, as we get to 150 kmph. Our acceleration is much faster and we can cover zero to 100 kmph in four seconds. Combustion vehicles would take 6-6.5 seconds," Karumanchi added.

As a Formula Student team, Raftar specialises in designing, building and racing a high-performance race car every year to compete against top engineering institutions in events across the world. Its 45 members are students from various disciplines, while the

team is part of the Centre for Innovation, a student-run lab at IIT Madras. The team looks forward to representing India at the international level, fostering standard engineering practices and nurturing real-world technical expertise among budding engineers.

"Raftar will soon become a platform to build future innovations such as driverless cars and connected mobility technology. 'RFR 23' showcases the endless hours and efforts taken by each and every member of the team over the past one year. This car is a culmination of the research, innovation and persistence demonstrated by the team," said Satyanarayanan Seshadri, faculty advisor for team Raftar. The team

REWINDING UP

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► An electric car by Raftar costs about ₹60 lakh, while the average combustion vehicle is priced at ₹35 lakh

► The e-car can cover 0 to 100 kmph in 4 seconds, as against 6-6.5 seconds taken by combustion vehicles

► Raftar specialises in designing, building and racing a high-performance race car every year to compete against top engineering institutions worldwide

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added that it was deploying 109 kilowatt permanent magnet motors, used on light aircraft. It also uses lithium ion NMC (nickel, manganese, cobalt) batteries.

"To coordinate the daunting task of building an entire vehicle, we divided ourselves into eight smaller groups focusing on a certain aspect of the car to fully optimise the systems under them," said Gaurika Bindal, a powertrain engineer and a team member of Raftar. "These subsystems include aerodynamics, frame and composites, vehicle dynamics, drivetrain, accumulator (or battery systems), high-voltage and cooling systems, and low-voltage systems," Bindal added.