सत्यमेव जयते
Ministry of Heavy Industries
Government of India

Azadi Ka Amrit Mahotsav

SMART | SAFE | SUSTAINABLE

ARAI TechNovuus MOBILITY HACKATHON 2022

MOBILITY INDUSTRY PROBLEM STATEMENTS

TO BE ADDRESSED BY ENERGY AND AGILITY OF YOUNG MINDS!

ORGANISED BY

ARAI
Progress through Research

COLLABORATION WITH

TechNovuus
Synergizing Technology & Innovation

ARAI ACADEMY
Excellence in Education

OUTREACH PARTNER

SAEINDIA
Society of Automotive Engineers INDIA

IMPLEMENTATION PARTNER

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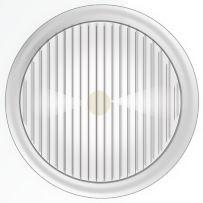
Problem Statements

1



Reducing glare of headlamp beams from oncoming traffic

"Driving at night can be quite challenging because of the reduced visibility. This problem is further exacerbated by the use of high beams, particularly within city limits where there is no provision for blocking the light beams of oncoming traffic.

This problem statement involves the development of a system that can optimise the lighting of a vehicle, while reducing the glare it may cause to oncoming vehicles. It may either be a smart solution which can control the beam selection, or a physical system that can reduce the glare of the beam from oncoming traffic. Crucially, can is be a retrofit solution to combat glare?"

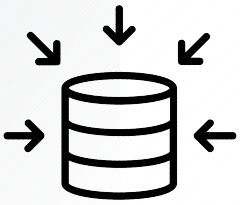
2

An emergency alert device that can connect with emergency services.

"2-wheeler safety has its own set of challenges. In the unfortunate event of an accident, the rider and pilion may not be in a position to call for help or contact emergencty services. This problem becomes acute in remote districts and villages.

Conceptualise a device that can be used to detect falls from a 2W and accordingly engage emergency reponse and call for help. The system may also provide alternative features like - park lock and vehicle locking, immobiliser, GPS tracking, impact detection, SOS, built in dash cam features, etc."

3



A simple data-acquisition system that can monitor and log basic EV performance characteristics.

"India is going through an Electric Vehicle revolution, and understanding the health and behaviour of the vehicle is an essential part of making an EV a successful product.

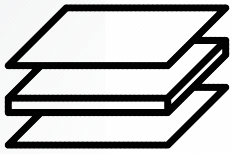
The statement requires the development of a unit that would enable complete data acquisition for an EV vehicle. This includes interface and drive inputs, current, voltage, temperature of the system from the battery, controller, motor and additional auxiliary units and systems along with gps co-ordinates, speed, altitude, vibration, etc. It should be able to log this information and output to a display in the form of meaningful information such as driving performance analysis, health of various systems, etc."

4

Re-imagining the 3 wheeler for today's needs and requirements

"The humble rickshaw has been around for ages, and has evolved over the years to keep up with the times and serve various purposes. With the EV revolution, can the 3 wheeler as we know it be redesigned for better ergonomics, lower weight, better aerodynamics, enhanced stability, using sustainable materials and improved safety?
Use your imagination and engineer a modern 3 wheeler that can meet all the needs of a modern vehicle. Develop a design using software tools to showcase your innovation."

5



Sustainable textile composites for body panels and upholstery

"Dust, chemical fumes, smog, etc. present in the Indian air and surrounding has an adverse effect on the upholstery material used in cars, leading to damage and cracking of surfaces. Besides that abrupt climate changes also contribute in intensifying this problem and recycling the used materials is also another big challenge.
Thus, the challenge to develop recyclable textile composites that use non toxic, reusable resins for use in vehicle body panels and upholstery. The material should be highly durable and able to withstand years of hard use on a vehicle in a variety of environments, climates and use cases (especially indian)."

6

Compact and easy to carry micro-mobility solution.

"Looking at the current sociographic indian scenario the biggest challenge automotives face in urban areas are lack and unavailaibility of parking spaces. Besides solving this issue it is of crucial importance to provide the people of our nation with an easy and compact mobility tool to enhance accesibility and reduce the time wasted in unnecessary travel.
Develop a collapsible/ portable last mile electric mobility solutions that is viable on Indian roads, environments and to all manners of individuals irrespective of gender, age or physical attributes. Showcase your micromibility

7

Safety innovations for 2 and 3 wheelers

"According to the National Safety Council statistics, 6 two wheeler riders die every hour on Indian roads, total no. of accidents being far more. Considering the dynamic nature of two wheeler accidents and lack of enclosed protection like cars, making advancements in internal technology to nullify other accident prone variables is of vital importance.
2W and 3W safety has slowly improved over the years, however there is still much to do about it. Come up with passive safety solutions for 2W/ 3W's to enhance safety, ease of use. The application should be compatible and viable on future EV replace-

8

Smart helmets for enhanced visibility

"A very banal problem stated by every helmet user is restricted side vision and excess neck load leading to overall hampered awareness while driving. Many a times you would have also observed 2W drivers without headlights ON and giving wrong or no signals while turning or halting, which lead to accidents and traffic issues. Such unnecessary accidents due to human error while driving a 2W can be avoided by providing instructions on the helmet screen.
One of the most common excuses given for not using a helmet is the relatively reduced visibility on wearing one. With several advances in technology, can you develop a solution to increase driver vision on a helmet? It can also provide additional warning and assist functions (blind spot warning, etc.). The solution needs to be cost effective, clip on and modular - retrofitable at the very least while

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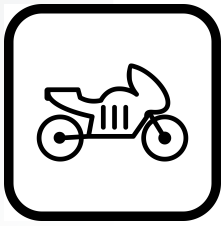
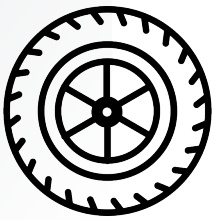


2 wheeler stability at low speeds

"Very often, we observe people struggling to balance their 2 wheelers at a signal or while in a congested parking or in slow moving traffic. Constant need to take support of our limbs while driving in traffic can be exhausting for the body and also accident prone.
Thus we need to develop a solution that stabilises a 2W, especially at low speeds or when coming to a stop. The solution should be aimed primarily for scooties and not take up too much space or payload while not severely impacting milage/ range and auxiliary consumption. Additionally this will be essential for differently abled individuals and those that are vertically challenged."

10



Tire health monitoring system

"Bursting of tires , punctures, slipping and skidding, etc. Are the reasons for many accidents in India. Besides that India being the largest country using pre owned and old cars, tire wear and damage is often ignored by drivers. Similarly perturbing issue with tires is collision on the side profile of tires(with stones, curbs, dividers,etc.) Leading to instant damage or bursting. To avoid such issues we need to have an a smart tire monitoring and maintainace system.
Therefore, develop a tool that can help identify tire wear, tire status / life and warn the driver for possible threats accordingly. "

How to register for ARAI TECHNOVUUS MOBILITY HACKATHON?

Students can directly register themselves.

You can click on ARAI TechNovuus Mobility Hackathon to register.

It is mandatory for all the participants registering for Hackathon to also register on Technovuus Portal.

What are the benefits to the students participating in the hackathon?

ARAI TECHNOVUUS MOBILITY HACKATHON is an innovation competition that aims at solving problems in the automotive domain offering:

- Encouragement to students to think innovatively and out-of-the-box
- Hands-on exposure working on industrial problems.
- Hand-holding and guidance from industry mentors for innovation projects
- Exciting prizes under various categories
- Boost confidence and team spirit

Hackathon Themes

SAFE

Safe and Reliable Mobility Solutions

SMART

Intelligent Devices and solutions for advancement of mobility systems

SUSTAINABLE

Sustainable mobility solutions for the dynamically changing needs.

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Process Flow

STEP 1: ARAI – TECHNOVUUS PROBLEM STATEMENTS GO LIVE AND REGISTRATION FOR THE HACKATHON OPEN.

STEP 2: TEAMS SUBMIT THEIR IDEAS AGAINST THEIR CHOSEN PROBLEM STATEMENTS.

STEP 3: IDEA EVALUATION AND 1ST ROUND RESULT ANNOUNCEMENT

STEP 4: CONFIRMING FINALIST AND MENTOR ALLOTMENT

STEP 5: GRAND FINALE AT ARAI PUNE.

STEP 6: FINAL RESULT ANNOUNCEMENT

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Timeline

Registrations Open

1st March 2022

Idea submission

1st March 2022 – 27th March 2022

1st Round Evaluation

28th March 2022 – 5th April 2022

Grand Finale

28th – 29th May 2022

FOR QURIES CONTACT :
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