



MECHATRONICS PROBLEM STATEMENT



Compact Safety Device for Public Safety

Design and develop an **innovative, compact, and concealed safety device** for **anyone**—including **women, children, senior citizens, and the general public**. The device can be designed for various forms such as **wearables, accessories, or integrated into everyday items**.

You have to make the bot physically or in 3D-simulations like in SolidWorks or in MATLAB or other preferred softwares.

BASE PROBLEM:

Design 3d model or develop a **small, portable easy to hide safety device** that can be easily carried in public place.

Include a **simple activation mechanism** for emergencies.

BONUS PROBLEM:

Enhance the base design by integrating advanced features to make the safety device more effective and versatile.

PLACE FOR INNOVATIONS:

Participants are allowed to use innovative ideas over the base problem.

Innovations may include use of different sensors and cameras and implementing AI-ML to

Recognise problematic situation automatically or designing a good web server through which information stored. Optimizations taken to reach proper accuracy, power consumption etc.



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CONSTRAINTS:

The device should be designed to be as compact and user-friendly as possible.

DC power supply and any **microcontroller** or **microprocessor board** can be used. Any **Sensor** can be used.

RULES:

You have to make the device physically or in 3D-simulations.

Participants will be scored according to:

- **Base Problem (0-100 points)**
- **Bonus Problem (0-50 points)**
- **Innovations (0-50 points)**

Submit a report which should contain the followings:

You have to make the device physically or in 3D-simulation.

1. Full description such as, model design, hardware and software working, electronics used, circuit schematics, power management, etc.
2. Optimizations taken to reach proper accuracy, power consumption.
3. Model limitations and places for further improvement.

Participants also have to submit working videos of their model if made physically or in simulations

ZYRO'2025 Website Link: <https://www.zyro-kgec.tech/>