



SCI-TREK THON 2024

PROBLEM STATEMENTS

A. Environment and Climate Change:

- Develop a solution on the community level to spread awareness and track and recycle efforts.
- Develop a way to fix carbon dioxide so that the emitted carbon dioxide can be fixed with less harmful substances.
- Create a solar-powered irrigation system for sustainable agriculture.

B. Health and Well-Being:

- Suggest ideas on monitoring and managing chronic health conditions with innovative technologies.
- Propose a solution for improving mental health support through technology.
- Create a tool that can use genetic information to recommend personalised patient treatment.
- Can we develop more effective treatments for cancer using AI and machine learning?
- Design a prototype managed by people or virtual interfaces to help individuals deal with stress, anxiety, phobias, loneliness, etc. It should engage the individuals with routine tasks and exercises and create awareness about mental well-being.
- Lipids and protein-based, cost-effective skin care.
- Ways for animal-free testing of products.

C. Education and learning

Space

- Design a solution for tracking and mitigating the risk posed by space debris to operational satellites and spacecraft.
- Space Biomineralization: Use of microorganisms to mine metal from space.

AI-driven

- Develop a prototype for an AI-powered learning platform that adapts to individual student needs, providing personalised lesson plans, feedback, and assessments.

Robotics and Automation

- Building robots that perform simple tasks using principles of mechanics and electronics. This could include designing a robotic arm or a line-following robot using sensors.

D. Sustainable Development:

- Propose an intelligent waste management system to optimise collection routes and reduce litter.
- How can we develop more sustainable and eco-friendly materials for construction and manufacturing?
- Develop an intelligent irrigation system that conserves water based on soil moisture data.
- Propose a solution for real-time water quality monitoring in rural areas.
- Create a prototype device that converts organic waste materials into clean energy through anaerobic digestion or other innovative technologies, promoting sustainable waste management practices.
- Develop a replacement for widely used plastic. It should be environmentally friendly and economically affordable. It provides step-by-step procedures to manufacture the material that can replace plastic.

E. Food Security and Agriculture:

- Design a vertical farming system for urban areas.
- Create a solution for reducing food waste at the consumer level.
- Cost-effective Non-animal protein for vegans.
- An eco-friendly, innovative way of storing and distributing food to cater to huge populations like India.