

## TECHFEST 2021-22

### I-WALLET

#### TASK:

Participating teams must come up with an implementation of a smart wallet, brainstorming new ideas to make the wallet smarter, secure and more intelligent.

#### PROBLEM STATEMENT:

The Internet of things (IoT) describes the **network of physical objects**—a.k.a. "things"—that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the **Internet**. This improves efficiency and brings important information to the surface more quickly than a system depending on human intervention.

Many a time, we find ourselves struggling to remember the cash spent in a day, stressing after misplacing our credit cards or simply forgetting where we last left our wallet. All these problems can be solved if we **integrate IoT into our wallets**, using intelligent sensors to store and report important data in real time.

Participants are expected to bring innovative ideas and prototype solutions to develop a **Smart Wallet**, to make the best use of IoT in our pockets. Given below are some ideas to get you started:

- **Credit card detection**- Often we all tend to misplace important cards (credit, debit, pan, etc) in our wallets. Design a system which can alert the owner if any one of the cards is missing from the wallet for a significant duration.
- **Cash count**- The wallet can be equipped with a system that can count paper currency in it and thus keep a track of total cash spent and balance in the wallet at the end of the day.
- **Wallet lost alert**- Losing your wallet can compromise your credit cards and bank accounts. Design a system which enables a wallet to quickly alert the owner if it is lost.
- **Credit card misuse prevention**- Users are advised to cancel all their cards in case of misplacing them. Unfortunately, it might be too late till one realises that important cards are actually missing. As a preventive measure, design a system to render the credit cards obsolete in such a scenario.
- **Harassment/ Threat Alert**- Devise a system which can sense the situation of harassment or threat to the owner and take appropriate measures. For example, it can emit shrill emergency sounds, send alerts to the concerned people, etc.
- **Anti Theft Systems**- In theft prone areas like locals or common public places, the wallet could activate an Anti theft mode, wherein the wallet could beep and flash in case of pickpocketing.

- **Sleep mode-** To minimise the energy consumption, the wallet could put unnecessary functions on standby mode when not in use. The above pointers are just guidelines to help you brainstorm. You are strongly encouraged to identify other relevant problems and come up with innovative solutions to solve them.

However, you must completely understand the working of all devices that you have utilised in your proposed solution.

## INSTRUCTIONS

- Throughout the course of this competition, you will **NOT** be required to submit the physical prototype. Therefore, feel free to use any sensors or systems that will help you with your implementation.
- However, you must completely understand the working of all devices that you have utilised in your proposed solution. You will be questioned upon this in the final presentation.
- The prototype you design is not expected to be integrable to the wallets as is, i.e., you can use sensors and devices that might not fit into the wallet dimensions currently. However, there are points for current choice of sensors and optimising the design in terms of spatial configuration.
- The competition will be held in two rounds, Abstract submission and the Design Report submission, followed by a presentation to the Judges Panel.
- Since you are not asked for the actual prototype, make sure to have detailed documentation of your design in the report submission.
- You also have to prepare a presentation for the final round, along with the completed report.

## GENERAL RULES

- Every team has to register online on our website for the competition. A Team ID will be allocated to the team on registration which shall be used for future references.
- A team can register at any point of time before 26th December 2021 and submit the Abstract (as mentioned in the structure).
- The decision of the organizers or judges shall be treated as final and binding on all. Techfest has all the rights to verify the identity and accuracy of the details provided by the participants.
- No responsibility will be held by Techfest, IIT Bombay for any late, lost or misdirected entries.
- The idea presented by the teams should be original (not protected by means of patent/ copyright/ technical publication by anyone else).
- Note that at any point in time the latest information will be that which is on the website. However, registered participants will be informed through mail about any changes on the website.
- All modes of official communication will be through the Techfest e-mail.

## JUDGING CRITERIA

- Creativity, originality and Novelty
- Functionality
- Durability and Usability
- Design and Ergonomics (Size Optimisation)
- Ease of Operation
- Commercial Viability
- Engineering Expertise

As mentioned before, size optimization is just a soft criteria. Your design can exceed the size of a normal wallet. However, you are expected to optimise the size for the given functions. (Eg: Can a smaller sensor be used? Or a smaller microcontroller could do the same operations?)

## ROUND 1 - ABSTRACT SUBMISSION

In this round, participants will have to submit an Abstract about their Design. It must contain the following:

- **Statement of Problem**- Succinct definition of problem addressed
- **Objectives**- What is your motivation? What are the objectives the prototype is developed for?
- **Introduction to Proposed Solution**- A basic idea of the solution to attempt to propose. Also explain the thinking behind the proposed solution.
- **Novelty of Approach**- How is/will your solution better than the existing products? Is there something unique to your solution?

The Abstract (as a pdf) must be sent by email to [iwallet@techfest.org](mailto:iwallet@techfest.org) with the team details clearly mentioned in the email. The Team ID should be explicitly mentioned in the email subject and the abstract file must be in the form of 'TeamID\_TeamLeaderName'. Any other name for the abstract file will not be accepted. **Last date for Abstract Submission is 30th November.** The Abstract submission round will be a soft qualification round.

## ROUND 2 - REPORT SUBMISSION AND FINAL PRESENTATION

This is the second and final round of the competition. It consists of 2 parts- the **Design Report submission and Final presentation**. You will have to submit a detailed design report of your prototype. The format of the report should be as stated in this problem statement. The teams will then be required to present their research and final prototype to the Judges Panel. These presentations will be held in Online Mode. Each team will be given a slot wherein they will have to explain their design. Teams are advised to have a PPT or a video ready to smoothen this process.

**TIMELINE:**

Abstract Submission	26 December 2021
First Round Results Announcement	2 January 2022
Final Report Submission	23 January 2022
Final Demonstration to the Judges Panel	30 January 2022

**REPORT FORMAT:**

- **Title**
- **Abstract**
- **Research**
  1. Proposed Solution In Detail
  2. Novelty of Approach: How is your solution better than the existing products that address the same problem?
- **Technical Report** - Technical aspect of the proposed solution
  1. Description of concepts, theories and/or working mechanisms
  2. Detailed technical specifications and pictorial representations (block diagram/flow chart)
  3. Components and modules
  4. Estimation of the total cost of the device with all its components
  5. Repository of the source code
  6. Experimentation/Verification done to establish the workability of the above
- **Results**
  1. Significant output of tests and analysis (Must be readable)
  2. Include problems encountered, credibility of results, accuracy and estimates
  3. Pros and cons of your solution
- **References and sources**
- **Optional but strongly recommended**- A video of the working of the prototype (simulations).

**TEAM SPECIFICATIONS:**

- A team may consist of a maximum of 4 members.
- Students from different educational institutes can form a team.

**Eligibility:** All students with a valid identity card of their respective educational institutes are eligible to participate.

**PRIZE**

The prize money will be awarded to top 3 winners via **NEFT** and will be processed within 30 working days after receiving the prize money from sponsors. Top 10 participants will get a certificate of excellence, and top 60% participants will get a certificate of participation. Winners have to mail the following information (immediately after the announcement of results) to [kunal@techfest.org](mailto:kunal@techfest.org).



**Format of Mail :**

Subject: I-Wallet, Team Id, Position (example: I-Wallet, IW211003 - 1st Position)

**Body of mail:**

1. Account Holder's Name
2. Account Number
3. Bank name and Branch name.
4. IFSC Code
5. Photograph of Bank Passbook as a proof