



# IEEE CSTAM 2.0 Technical Challenge

## SCOPE & TOPIC:

In a world where healthcare is increasingly digital, this challenge explores the intersection of **cloud computing, generative AI, and secure mobile/wearable innovation**. Developing **AI-powered health and nutrition companions** that leverage cloud infrastructure to provide real-time insights, wellness prediction, and lifestyle coaching.

All while ensuring **data privacy, inclusiveness, and scalability** is our Interest !

## CHALLENGE OBJECTIVE:

Develop a cloud-native, GenAI-powered mobile and/or wearable application that delivers personalized health and nutrition guidance by analyzing meals, physical activity, and wellness data, while ensuring secure data processing, ethical AI integration.

The solution should enable:

- Real-time health analysis and wellness prediction
- Personalized fitness or dietary recommendations
- Scalable cloud infrastructure
- Readiness for real-world deployment and startup incubation

## TECHNICAL INSTRUCTIONS & DELIVERABLES:

### 1. Cloud-Integrated Prototype

- A mobile or smartwatch application (or simulation) showcasing core GenAI health features
- Must include at least one generative AI use case (e.g., meal interpretation, personalized coaching)

### 2. Data Collection

- Identify the **types of data** your app collects (e.g., images of meals, user health history, sensor data, fitness tracker inputs)
- Specify **collection methods**: manual input, wearable sensors, API integrations, photo capture, etc...
- Ensure appropriate user consent mechanisms and adherence to data ethics

### 3. Data Processing Pipeline

- Explain how collected data is **cleaned, transformed, and prepared** for AI model consumption
- Highlight any preprocessing steps (e.g., image resizing, feature extraction, tokenization, normalization)
- Outline how data is **transferred to and from cloud services**, ensuring privacy and real-time usability

### 4. Cloud Storage & Integration

- Show how data is stored and retrieved using **cloud infrastructure** (e.g., Firebase, AWS S3, Azure Cosmos DB)
- Include security practices like **data encryption, IAM roles, and backup strategies**
- Emphasize modularity and scalability of your cloud design

### 5. System Architecture Diagram

- End-to-end system diagram including frontend, cloud components, GenAI model(s), and data pipelines
- Label third-party services (e.g., cloud functions, ML APIs) and their roles

### 6. Security & Privacy Design

- Detail methods for ensuring secure data access, storage, and transmission
- Include privacy-preserving mechanisms (e.g., anonymization, encryption at rest and in transit)
- Demonstrate alignment with GDPR, HIPAA, or other relevant regulations

### PS . Free Tools & Workarounds

- **Data Storage**: Use MinIO (S3-compatible, Docker-ready) as a free local alternative to AWS S3. Swap credentials later for deployment.
- **AI APIs**: Tools like DeepSeek offer free GenAI APIs for NLP and health logic.
- **Cloud Simulation**: Local setups (MinIO, mock APIs) are accepted. Just explain what cloud services they simulate.
- **Student Credits**: Use your **GitHub Student Pack**



**ENTREPRENEURSHIP INSTRUCTIONS & DELIVERABLES**

- 1. Business Plan (including a complete Business Model Canvas - BMC)
- 2. Proof of Concept (POC)
- 3. Pitch Deck
- 4. Promotional Video showcasing the product

**Bonus Points (Optional Enhancements):**

Additional points will be awarded for teams that go beyond the basics and provide any of the following:

- Marketing Campaign (offline or online)
- Digital Marketing Strategy
- Other entrepreneurship-related initiatives (e.g. branding, customer validation, etc.)
- Join Entrepreneurship LG Workspace on Colabratec: 0.5pt per member (maximum 2 points)

**SUBMISSION :**

- Submission form link : [Link](#)

**RULES & CRITERIA :**

- Teams of 3 (minimum) to 5 members (maximum).
- Open for IEEE and Non-IEEE students

**PITCHING DURATION :** 5 mins

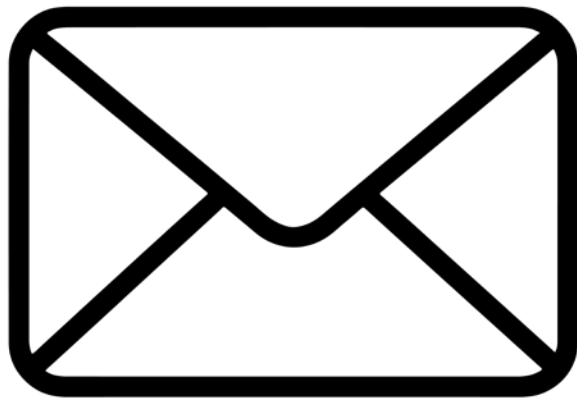
**PITCHING LANGUAGE :** ENGLISH

**WINNERS :**

- Number of winners : 3 Teams
- Prizes : will be announced later

**Important Date :**

- Submission deadline : 08 Nov. 2025



**For any inquiries or clarifications, please contact us at [cstam@ieee.tn](mailto:cstam@ieee.tn)**