Support INEM operational well-being using Smartwatches

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Motivation

In INEM, vital responders (i.e., Técnicos de Emergência Pré-hospital (TEPH) in INEM [1]) have a potentially stressful profession due to factors that can be acute (an accident) to long time/chronic patterns (the schedule, unusual sleep patterns). The existence of day-off and personal management strategies based on TEPH teams is still considered the strategy to minimize the effects without compromising the actual performance of emergency teams as a whole.

Markers and baselines, as quantified measures, can support better identification of relevant patterns in an emergency setting, namely fatigue, an emotional status that can be signs of a build-up of unhealthy psychophysiological situations or trends (building up of depressive state, burndown, etc.). Using wearable devices together with psychological assessment may be a solution to provide such quantification.

Can we characterize the different roles of the TEPH in extensive periods to identify baseline and markers specific to each function to manage the emergency teams better? Are there response patterns/features specific to types of acute events? If so, are they different among different emergency roles?

Context

An ongoing pilot phase (started in July) is underway comprising 5 TEPH workers using the Samsung Smartwatch model Watch5. There is already data and some operational issues identified.

The main objective is to have a solution that:

- **Works in real INEM scenarios** allows data visualization and primary processing and is “easy” to use by data scientists.
- Helps identify trends between one or more day-offs that allow better identification of positive and negative trends that could **help manage the team** and prevent (when possible) unhealthy psychophysiological situations
- If successful, it can scale at the national/regional level

Objective

The main objective is to monitor TEPH **using smartwatches as a sensor,** and the project50 may address more technical or data analysis:

- Technical: Deploy/provide a unified data collection and processing solution based on smartwatches for INEM TEPH monitoring and data collection. **It should be able to scale at the national/regional level and be “easy” to use by data scientists.**
- Data analysis: Look for patterns and trends between one or more day-offs that allow better identification of positive and negative trends that could help manage the team and prevent (when possible) unhealthy psychophysiological situations. **Tools and methods are open to suggestions by candidate students.**

Research scope

This work is integrated within the R&D activities of IEETA and is part of a project combining StrongStep (https://strongstep.pt/en/ - project leader) and INEM (https://www.inem.pt/)

References

On Técnicos de Emergência Pré-hospitalar (TEPH) - In PT:
https://www.inem.pt/2023/03/01/inem-mantem-aposta-na-formacao-teph/