EUROPEAN UNION

#HorizonEU

INFO DAYS 2023
BROKERAGE EVENT
CLUSTER | HEALTH

THE EU RESEARCH & INNOVATION PROGRAMME 2021 - 2027

University of Hradec Králové
Faculty of Science

Remote monitoring and evaluation of vital state

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Topics of interest

We would like to join a consortium in following topics:

- **HORIZON-HLTH-2023-STAYHLTH-01-01:** The Silver Deal - Person-centred health and care throughout the EU

- **HORIZON-HLTH-2023-DISEASE-03-01:** Novel approaches for palliative and end-of-life care for non-cancer patients

- **HORIZON-HLTH-2024-STAYHLTH-01-05:** Personalised prevention for non- communicable diseases - addressing areas of unmet needs using multiple data sources

Project ideas

Unobtrusive monitoring of vital functions by evaluation of body micro-vibrations

- **Parkinson's disease** tremor monitoring

- **Care quality, well-being, and stress levels** of the elderly and persons with special needs

- **Pharmacodynamics monitoring** – unobtrusive evaluation of effect of drugs on vital functions in real time (anti-depression, sedatives, anti-inflammatory)

- Relative measurements of **cardiac output**

- Improved accuracy of **atrial fibrillation monitoring**

- **Personal blueprint of human cardiovascular system** and its changes – applications in biometrics

- **Respiratory effort changes** for evaluation of respiratory diseases, detection of various types of breathing

- **HRV changes** during the inflammation process

- Prediction of **development of infections** and other contagious diseases

Topics for cooperation

- **Studies based on monitoring of persons using wearable technologies and targeted questionnaires based on evaluation of data in real time**

- **Studies using our server and smart phone (Android & iPhone) application for sending questionnaires and prompts to participants based on given rules and current vital and environment data**

- Ecological momentary assessment studies

- Studies involving environment data (based on GPS location and public data sources such as air quality)

- Complex rules created by researchers

- Detailed compliance reports

- Rules based on steps, heart rate, sleep, HRV, active minutes

- Anomaly detection

- Questionnaires & prompts:
  - time-based, in adjustable time windows,
  - immediate,
  - event-triggered by given rules (such as context-based EMA),
  - self-initiated
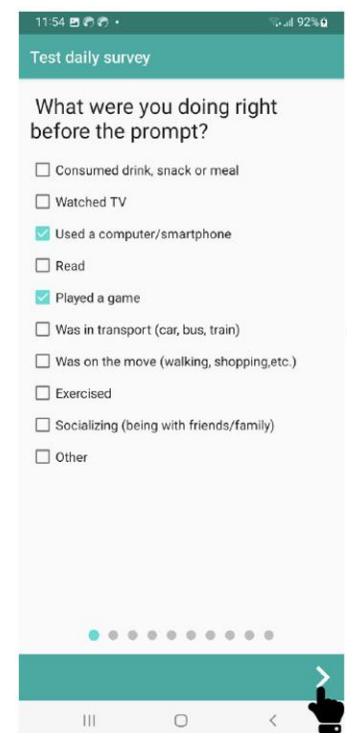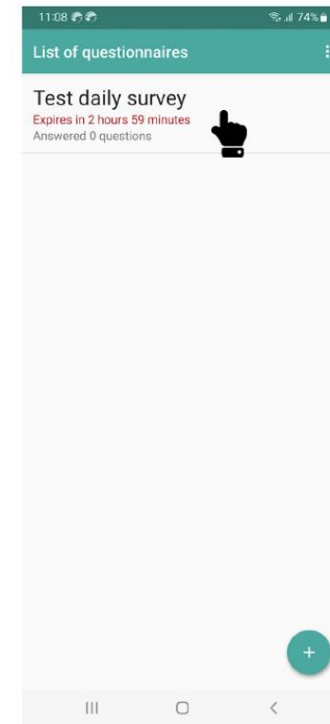
What we bring into consortium

- Team of persons focused on vital data collection and analysis using advanced statistics and machine learning methods.

- Hardware solution for unobtrusive data collection and evaluation - sensor pads and/or wearables measuring HRV, respiration rate, micro-vibrations, pulse wave velocity, ABI index, tremor.

- Software tools for remote vital signs monitoring and mHealth interventions.

- Server and smartphone application for studies management enabling sending questionnaires and prompts based on current data and complex rules.

- Algorithms development based on advanced signal processing.

- Infrastructure for neural networks long-term training & HPC Cluster.

HNN3.0
HEALTH-NCP-NET

Related projects

- NU21-09-00007 → mHealth intervention delivered in general practice to increase physical activity and reduce sedentary behaviour of patients with prediabetes and type 2 diabetes (340 persons)
    - Link

- TL03000520 → SMART Solutions Across Continuum of Care for the Elderly (200 persons)
    - Link

- HDHL-INTIMIC 2021 → Standardized measurement, monitoring and/or biomarkers to study food intake, physical activity and health (STAMIFY) - Wearable sensors for the assessment of physical and eating behaviours – (WEALTH) (640 persons in 4 EU countries)
    - Link

- HAIE CZ.02.1.01/0.0/0.0/16_019/0000798 (Subcontract) → Healthy Aging in Industrial Environment HAIE (1 300 persons)
    - Link