

# Sensing spaces

Team: Planck

## Background/context

Human senses can give us a great deal of information about our environment, but their range is limited by our perception and memory. The environment is full of signals, frequencies and patterns, that we are unaware of, but which could potentially tell us a great deal about the state of the affairs. By using piezoelectric films, visual heat maps or a combination of frequency sensors currently unutilized data could be captured and turned into novel insight about our everyday surroundings. Interpreting this data to long-term “biorhythms” of the environments could be one way of including and interpreting the long-term timescale of the collected data.

## Mission

How can we empower the individuals to affect their surroundings by using a combination of environmental data and interpretations of human behaviors? And how could we enhance this with context-aware, personalized and anticipatory services on e.g. well being, security and safety?

## CERN connection

- Sensory equipment and development in CMS detector - Sergei Lusin (CMS)

## Society connection

- Changing the world by exploring ways to utilize environmental data to improve the quality of life of individuals.
- Understanding the current state of the industry & possibilities with Manutencoop - Stefano Donati

## Exploration questions

What are we able to sense (e.g. peoples positions, energy levels, emotions, heat, air flow..)?

What can be learnt about the “biorhythm” of the environment over weeks, months and years?

What kinds of ways of sensing can be utilized?

How to extend the current industry business models from corporate level to individual level?

How can we interpret sensors data and environment "biorhythm" to anticipate issues, damages or failures in buildings and environment?

How could we use sensors data to improve quality of life of the people in their environment?

## Target users

Individuals who operate in the measured environment regularly and are most affected by it.

## Expected outcome

System, that allows the users to access meaningful and actionable information about their environment and connect to potential and relevant service delivery inside and beyond the buildings.

**Success metrics**

Concept is validated with a proof of concept prototype, tested with real users. Positive social impact of the solution is clearly demonstrated.

**Research plan**

Explore different sensing technologies available at CERN and in the consumer market.

Look into how the people are affected by their environments and what are the currently used and unused metrics.

Identify some of the areas with most potential to end users and to service providers by using the expertise from Manutencoop (for example: energy consumption, people activities, employees coordination, systems optimization, etc...).