

Announcement for Architecture,
RNB, or Biomedical Engineering
Students*
Master Thesis or Study Project

SUPERVISION

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* Students from other disciplines are still
encouraged to apply. Please make sure that
we can officially supervise your studies.

RELATIONSHIP BETWEEN CORE TEMPERATURE, SKIN TEMPERATURE AND ELECTRODERMAL ACTIVITY LEVELS - A PHYSIOLOGICAL AP- PROACH TO THERMAL COMFORT

CONTEXT

Definition of "comfort" has long been a question for professionals of the built environment. Particularly the numerical definition of it, not only decides how we operate our buildings, therefore manage resources but also how the buildings impact our well-being in return. However, this reciprocal relationship still lacks clarity on certain aspects, as research shows that occupants are consistently dissatisfied with the indoor climate and that most buildings struggle with huge performance gaps between simulations and actual measurements.

As the majority of data acquired in the comfort literature comes from user feedbacks, there are concerns with bias, data resolution, or scalability. Furthermore, it is proven by the research that maybe comfort is not what we should be after, but rather health - and not always these two mean the same thing.

Therefore, research project SenseLab aims to tackle the comfort definition from a newly emerging point of view: Directly looking into the human body. By doing so, we believe that we might not only identify the link between perceived comfort and its physiological markers, but also collect long-term data to observe how the indoor environment impacts our health and well-being.

TASKS

This study will focus on a more fundamental side of the ongoing SenseLab research. At the moment, from both our previous studies and the existing work of literature, we can identify a correlation between indoor operative temperature and skin temperature and/or electrodermal activity. While the skin temperature and/or electrodermal activity can be used as indicators of the heat stress on the body, a more direct relation would be including the core temperature in this correlation.

Therefore we are looking for a student to carry out a controlled experiment in the SenseLab, where we will measure the aforementioned physiological values under controlled temperatures. After the completion of the data-collection, preliminary analysis and visualisation of the data is expected to illustrate how core temperature, skin temperature and electrodermal activity are correlated.

For the data collection phase, no specific experience is required. For the analysis and visualisation part, some preliminary knowledge of Python with relevant libraries (ie. Pandas, NumPy, SciPy Matplotlib/Seaborn, etc.) would be beneficial.

