Urban Stress Level Monitoring (Case Study)

1. Summary:

The summary should characterise the application and place the planned project in a wider scientific context.

*(According to the SNF research plan for project funding)*

The project is to gather datasets of several study participants, which will allow us to link their stress level to environmental influence. This will be achieved by having them carry a backpack with several sensors integrated in it to monitor environmental values. At the same time we provide them with a biofeedback wristband to monitor their personal stress level.

Our goal is to get clues on how different locations, times of day and gas pollution affect stress levels and in which way.

2. Motivation: ?

Statement of the problem. Statement of the problem or gap in the current research in the field of study.

3. State of the art: ?

Making reference to the most important publications, particularly by other authors, please explain:

• which previous insights provided the starting point and basis for the planned studies

• in which areas research is needed, and why

• which important, relevant research projects are currently underway in Switzerland and abroad

*(According to the SNF research plan for project funding)*

Historic and current state of research in the field. By addressing the literature, you will place your research into its context and reveal what problem it is attempting to address.

4. Previous work (Optional): ?

Present the research work you have already undertaken in the relevant field or in related fields and mention the corresponding publications.

Re-port on the work conducted in the scope of the previous project and the results obtained.

*(According to the SNF research plan for project funding)*

5. Research Question and Hypothesis:

Determine the Research Purpose, Hypotheses and Research Questions.

Our goal is to find an effective method to display and visualize our gathered data and also quantify our results dependent on time and location.

Which environmental factors influence the stress level of our study participants?

If yes in which way to these factors affect our study participants?

Is it possible to quantify our results? Can we make qualitative conclusions?

6. Approach and Method:

Specify the approach you are taking and the concrete objectives that you aim to achieve. The following points should be addressed:

• Studies or experiments needed and/or envisaged to reach the set goals

• Methods by which the research goals are to be reached

• Data situation / collection of data

*(According to the SNF research plan for project funding)*

Construct a research proposal - Detailed description of how the study will be conducted.

We start by gathering our own data from study participants. All study participants have to do an initial calibration of the biofeedback wristband, by reading a lullaby to get their personal low stress level and playing a scaring game to get their personal high stress level.

After the biofeedback is calibrated we send them on a given track through Wiedikon and record their stress level. On their track all study participants carry a sensor backpack which is equipped with several sensors to gather environmental data, e.g. Wi-Fi-devices, location, soundpressure, temperature, humidity.

The achieved data will be matched with pre-defined cases.

7. Project Schedule:

Compile a schedule that includes the most important interim goals. This plan should also indicate the main tasks.

*(According to the SNF research plan for project funding)*

* Gathering a dataset to have example material
* Create outline of project, which sensor we use
* Define methods of data categorization (define Pre-defined cases)
* Program data analyzation algorithm
* Get real data from study participants
* Analyze the real data with the programmed algorithm
* Find conclusions

8. Contribution and expected outcomes:

-Scientific relevance:

Describe the impacts you expect your research in the pro-posed project to have for the discipline and for science as a whole (research and education/teaching). In addition, please mention the form in which you wish to make your research results public (articles in science journals, monographs, conference proceedings etc).

-Broader impact:

Indicate whether and to what extent the proposed project will have a broader impact and what this impact will be. The following points should be addressed:

• Need for research as perceived by practitioners/industry: Are there any knowledge gaps? Are innovations and improvements expected?

• Transferability of results: To what degree can research results be put into practice?

• Other potential impacts: In which spheres outside science could the implementation of the research results entail changes and what is the nature of these changes?

*(According to the SNF research plan for project funding)*

Consider research implications - Importance of your study.

The conclusion of this project is very important for future city planning, as it will be possible to intentionally create areas with reduced stress levels to balance the stress level of common citizens.

Future research could focus on manipulating stress levels in cities, correlating work efficiency with stress levels or correlating health issues to stress levels.

9. Bibliography and references ?