Pride and Prejudice
'Tackling chronic disease prevention through real-life monitoring and context-aware intervention design'

A healthy lifestyle is key to people's health and vitality. Physical activity and diet are two key lifestyle factors for sustainable health, which are also strongly linked with each other. In modern affluent societies where food is
abundant and available 24/7, and where people are constantly seduced by companies' marketing efforts, it is extremely challenging to stick to a healthy diet combined with regular physical activity, and many people are unable to change their habits.

Physical activity and diet share another feature: they are not only difficult to modify on the long-term, but are also difficult to measure. So far, most studies have relied on self-report, from which it is notoriously difficult to gain reliable and valid measures. Memory bias, social approval, and social desirability bias occur frequently in reporting of various aspects of dietary intake (what was eaten, how much) and in physical activity (what was done, for how long and at what intensity). Hence, objective, longitudinal measurements are urgently needed to gain more insight in actual behavior.

The novelty of this program lies in combining the monitoring in real-life through sensors (food intake, physical activity and health parameters) with development of design interventions at different levels of the system (person, group, society), and evaluation of the (long-term) effectiveness of these combined interventions. The development of the interventions will address both the socio-cultural context (e.g., household type, (sub)culture) and the physical context in which products are acquired and consumed and where physical activity can take place (e.g., stores, kitchens, restaurants, parks, city squares).

This is achieved in the following ways:
- Design of **innovative sensor systems and data acquisition technology** to acquire real-life field data on food intake, physiological reactions, and physical activity patterns in an unobtrusive way.

- Using and extending **intelligent and adaptive systems and data representation techniques** (nonscreen representation), to develop interventions with the ability to positively affect behaviour.

- Extending possibilities of **integration of electronics and textiles** (e.g. smart wearables) to create interventions that can be seamlessly and unobtrusively integrated in people's lives.

- Develop a **virtual coach** that will support users in making value-aware agreements with people in their social circle about sharing personal data and desired behaviour changes. It will support compliance with these agreements, based on a combination of data-driven methods (using sensor data) and knowledge-based reasoning (representing behaviour and social agreements).

- Design new tools and techniques **to motivate individuals and groups** to take responsibility for their health status and work actively (together) on improving nutrition and increasing activity.

- Validate outcomes **on the long term** to determine their effect on sustained behaviour change.

The program will be managed by a board of representatives of the 4 universities: Aarnout Brombacher (chair, TU/e), Rick Schifferstein (TUD), Hermie Hermens (UT), and Kees de Graaf (WUR). Marjolein van Lieshout (TU/e) is program director. The proposed program manager Brombacher has high affinity with the program content, extensive experience in managing multidisciplinary research cooperations (CRISP, IOP-IPCR, Topteam Sport and Vitality, Design United), and has fulfilled an 8-year period as Dean of Industrial Design TU/e.