

INTERNSHIP/FINAL THESIS –Developing an application for the Wearable Breathing Trainer

The Wearable Breathing Trainer (WBT) is a wearable that is developed to support adequate breathing for children (8-15 years) with dysfunctional breathing. During the treatment with the pediatric physiotherapist, different breathing exercises are performed with the aim to breathe towards the abdomen, decrease superficial breathing or breathing frequency. The goal of the treatment depends on the complaints of the child, which makes every treatment personalized to the needs of the patient. In combination with the treatment at the pediatric physiotherapists, children are also asked to perform breathing exercises at home, which are often considered boring. The WBT can support home treatment by monitoring breathing through a sensor placed at the thorax and the abdomen in combination with haptic stimulation for creating effective breathing exercises.



TASK DESCRIPTION

The aim of this project is to develop a graphical user interface to be used in combination with the breathing sensor (Breathpal) and vibration motors. You are free in choosing the type of GUI - website, computer application, mobile app (iOS/Android) - as long as it effectively combines the sensing and actuation components. The project's initial requirements are derived from interviews with pediatric physiotherapists and must include personalization features such as changing the vibration intensity and selection of different vibration patterns. It is important that a robust connection between the breathing sensor and the vibration motors is maintained, ensuring accurate feedback and control. The vibration patterns are already created based on previous interviews and profoundly tested with pediatric physiotherapists. However, more can be added. An initial idea for the GUI is developed by high school students and can guide as inspiration for the design. You will collaborate with material experts, designers, and textile engineers within our research group, and get the opportunity to involve the whole project team (UT, MST, Deventer Ziekenhuis, Elitac Wearables, among others).

PRACTICAL INFORMATION

- **Student profile:** We are seeking a talented student specializing in Embedded Systems, Interaction Technology, ICT, Electrical Engineering, Mechatronics, Industrial Design, Computer Science, Creative Technology or a related field to join our team. If you have a solid background in programming (GUI) applications paired with electronics, and a passion for developing functional prototypes, we invite you to apply. This opportunity may involve an internship or a graduation assignment.
- We are looking for a student that can connect different fields of expertise, who is hands on in his/her approach. You will mainly work independently, but you are pro-active in including relevant partners in your research. As a group, we work together to achieve the best results in our projects.
- **Contact person(s) for this assignment:** Melissa van Schaik / m.e.vanschaik@saxion.nl +31616007678
- **Research group Sustainable and Functional Textiles:** saxion.nl/sft