WELL-BEING

Philosophers like to ask: what makes a good life? Reimagined healthcare systems. New visions of healing, beyond efficiency. Human-powered wholeness. It's not just about traditional ideas of health, it's about making sure that people are happy with their lives. How can we best support human flourishing and welfare?

FOSTERING

Positive
White Cane

Most products that visually impaired people use on a day-to-day basis are modified versions of products designed for sighted people. This project was inspired by the resilience and resourcefulness of visually impaired or partially sighted communities. The customizable cane incorporates a connected handle, which can be outfitted with modules developed in collaboration with non-sighted users by independent developers, health professionals, and organizations such as Visio. Since it also functions as a data gathering device, the connected cane helps professional ergo-therapists and city planners in their efforts to make the world more accessible for all.

DIGITAL PROTOTYPING

RIGGING

This project generated a new parametric approach for optimizing the fit and comfort of a wetsuit design using 3D anthropometric data. The current wetsuit industry relies heavily on 2D anthropometric measurements in creating a fit for wetsuit patterns. A time-consuming prototyping process is then used to optimize the pattern. With the increasing availability of technologies such as 3D scanning, designers are able to gain more insight into the complex surfaces of the human body. Using detailed 3D mannequins in combination with motion capture data, it is possible to design and assess both the static and dynamic fit of a wetsuit. This prototype was created to validate the potential of this 3D anthropometric approach and its reduction of physical prototyping.

The Virtual Reality Exercise Environment is an immersive exercise experience designed to stimulate extrinsic and eventually intrinsic motivation of people using cardio machines. This hybrid digital-physical project is informed by behavior change theory and the applied cognitive psychology concept of 'optic flow.' Optic flow is the perceived motion of objects as an observer moves in relation to them. Research on how optic flow can influence walking speed led to experiments in a VR exercise environment. Since manipulating this parameter involves changing everything the user sees, the VR environment was a crucial design element. In this interactive installation, V.R.E.E. explores the concept of linking virtual reality to real-life impact.

BagSight

Taking inspiration from both guide dogs and the cybernetic concept of Braitenberg vehicles, BagSight is a research artifact exploring how designed objects can express their own intentions. By tightening its cord, this backpack moves on the back of the wearer during navigation of a city in order to express its feedback or desires. BagSight's kinesthetic behaviour is designed in such a way that it can be seen as being afraid of obstacles (desiring to move away from them) and interested in moving towards a given goal. In a research study, participants described their experience of using BagSight as similar to an extension of their sensory organs, viewing it as both instrument and agent.

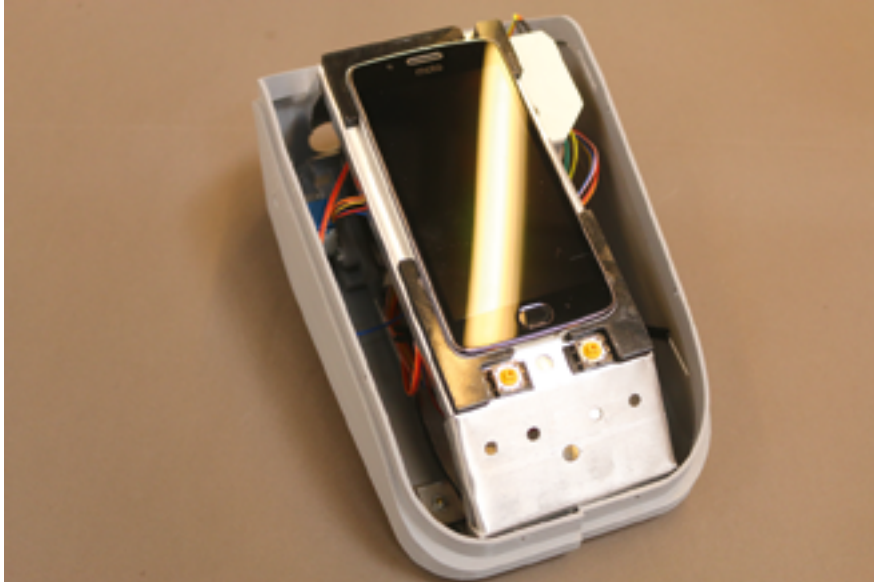# Excelscope 2.0

TU Delft

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This low-cost malaria detection device reduces the workload of medical staff in developing countries while increasing the accuracy and decreasing the cost of diagnoses. Based on research performed by OSMD and TU Delft, the Excelscope automates analysis of blood samples for malaria, using its ball-lens to magnify blood samples, capturing multiple fields of view within a blood sample with its smartphone camera, and then utilizing an algorithm to accurately determine the number of parasites present. While other algorithms in existence often rely on professional microscopes, and while cheap microscopes usually require a component of manual labor, Excelscope is a uniquely integrated detection device, including a fully-automated 3-axis moving system.

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OMNI
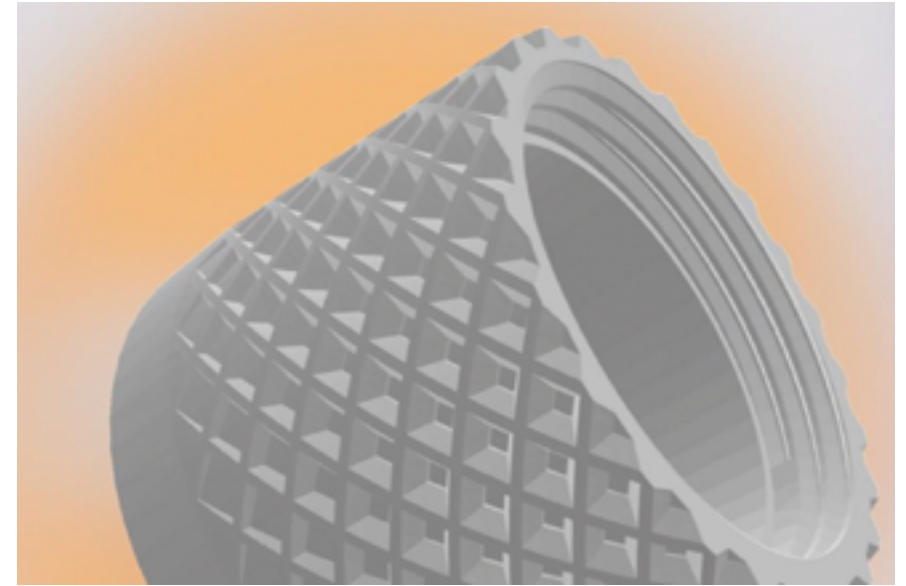
This project began with the vision of creating a social game which is playable by everyone, including people with visual impairment. While there are many high-energy reaction games available, most are not playable by non-sighted or partially-sighted users as the feedback that players must react to often comes in a visual form. The game of OMNI does not involve sight, but instead gives feedback for players to react to in the form of different vibrations. Therefore, the game can be played by both sighted and visually impaired people, increasing interaction and connection.

Interactive Dining Table

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Eating is often a social activity. We sit together with friends, family, and colleagues to connect, share, and celebrate aspects of life. This interactive dining table is embedded with load cells and LED lights. The load cells are able to measure different aspects of eating behavior such as weight shifts around the table, collecting both individual data about dining behavior as well as social data about interactions between table members. Over the course of the meal, light signals from the table provide table members with feedback about their actions, give perspective regarding their eating choices, and cue more social dining behavior, all in the form of qualitative, expressive interactions.

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Lorenzo Romagnoli
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See My Wrist
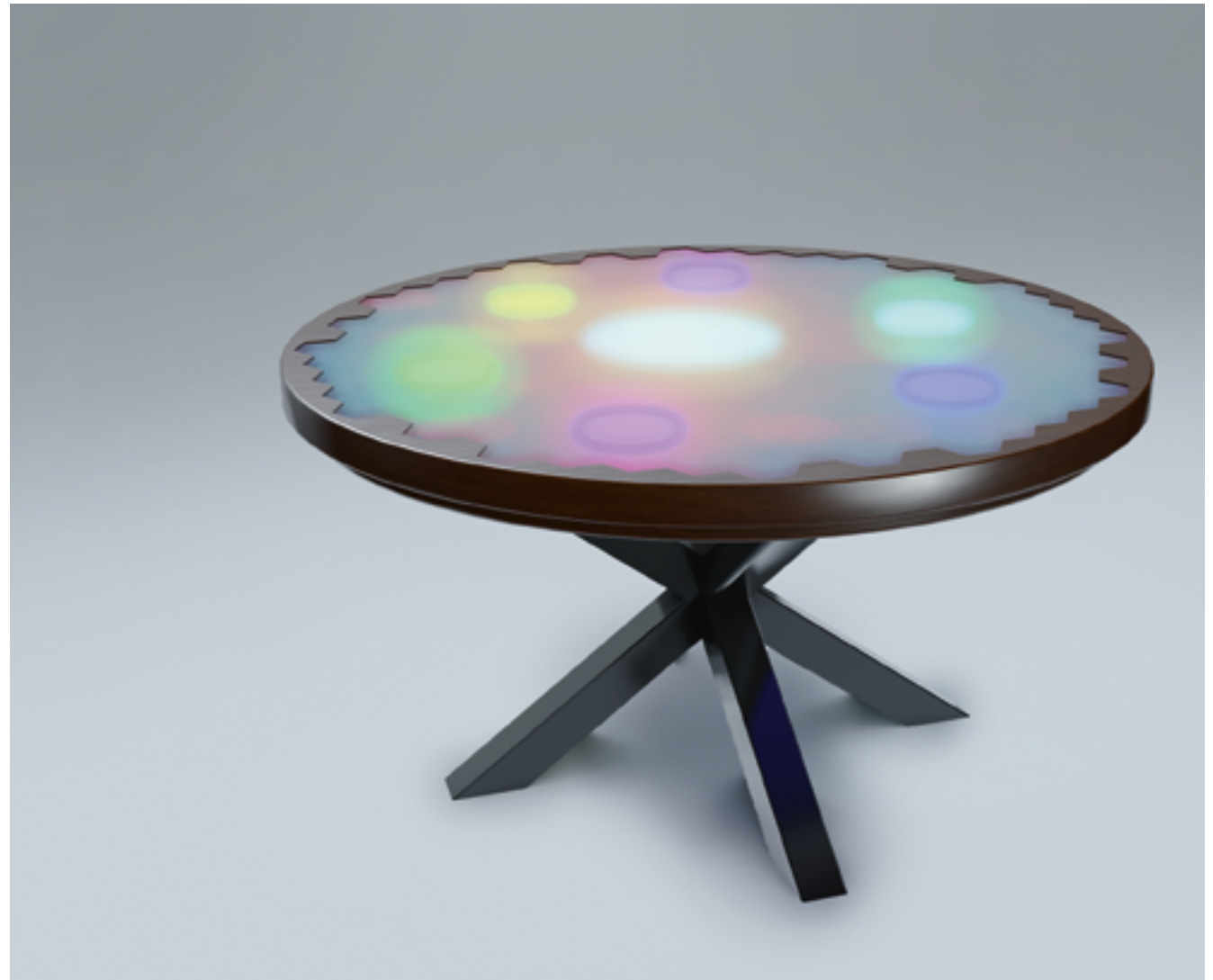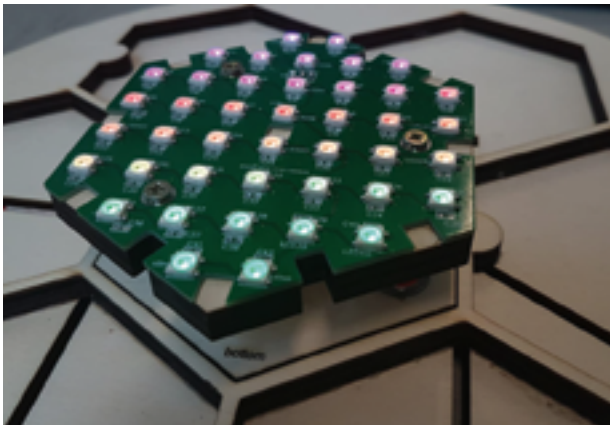
Wrist instability is a long-term condition with a high level of adherence challenges for patients. In this project, a 10 month research investigation in collaboration with the orthopaedic surgeon Dr. Gerald Kraan and the digital behavior change agency DIO, gameful methods of wrist instability exercises were explored and tested with patients. The design is a set of wrist-worn sensors which, combined with online feedback, enable patients to both keep count of their exercise repetitions and know whether they are doing the exercises right, addressing two key challenges that emerged out of research with wrist instability patients.

Wearable Breathing Trainer

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Jean Driessen
Ben Bulsink

A child with a respiratory disorder is often referred to a physical therapist who works with them to improve their breathing technique and educates them about self-assessment for dysfunctional breathing patterns. However, there is a lack of tools that can support children during breathing retraining, especially tools that can also guide and support caretakers and healthcare professionals in monitoring the long-term development of a child's skills. This breathing trainer is made of robotic textile and equipped with sensor technology and LEDs, allowing it to detect and analyze respiratory disorders as well as provide real-time haptic and visual feedback during breathing retraining.

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FleXo: Flexible Exoskeleton for Therapeutic Touch

When introducing robotic or automated interactions into healthcare, a missing component is often human touch, a connection that communicates both emotion and energy. FleXo is a bioresponsive inflatable garment that facilitates the exchange of healing, therapeutic touch between a caregiver and a patient. This mediated touch is conveyed through FleXo's silicone pneumatic elements for acupressure via visual and haptic feedback. The unique platform personalizes its inflatable actuation into a haptic language specific to the individual user. Throughout the experience of using FleXo, biosensing is employed to support and log emotional response and to continually adapt the soft exoskeleton's behavior. As a wearable system, FleXo supports both self-management and the use of mediated touch for wellbeing.

Mouthfeel

Dysphagia patients are people who have difficulty swallowing and may have to live on limited or liquid diets, losing the pleasure of experiencing different food textures. With a 3D food printer, this project created a textured snack that dissolves into a liquid in the mouth. By focusing a high-tech design intervention on improving the small, human pleasure of 'mouth feel,' this installation puts forward a bold reframing of sensibilities for health and ability-centric designs. The 3D printing food investigation in Mouthfeel takes place as part of a larger study on production methods for shape and texture changing foods.

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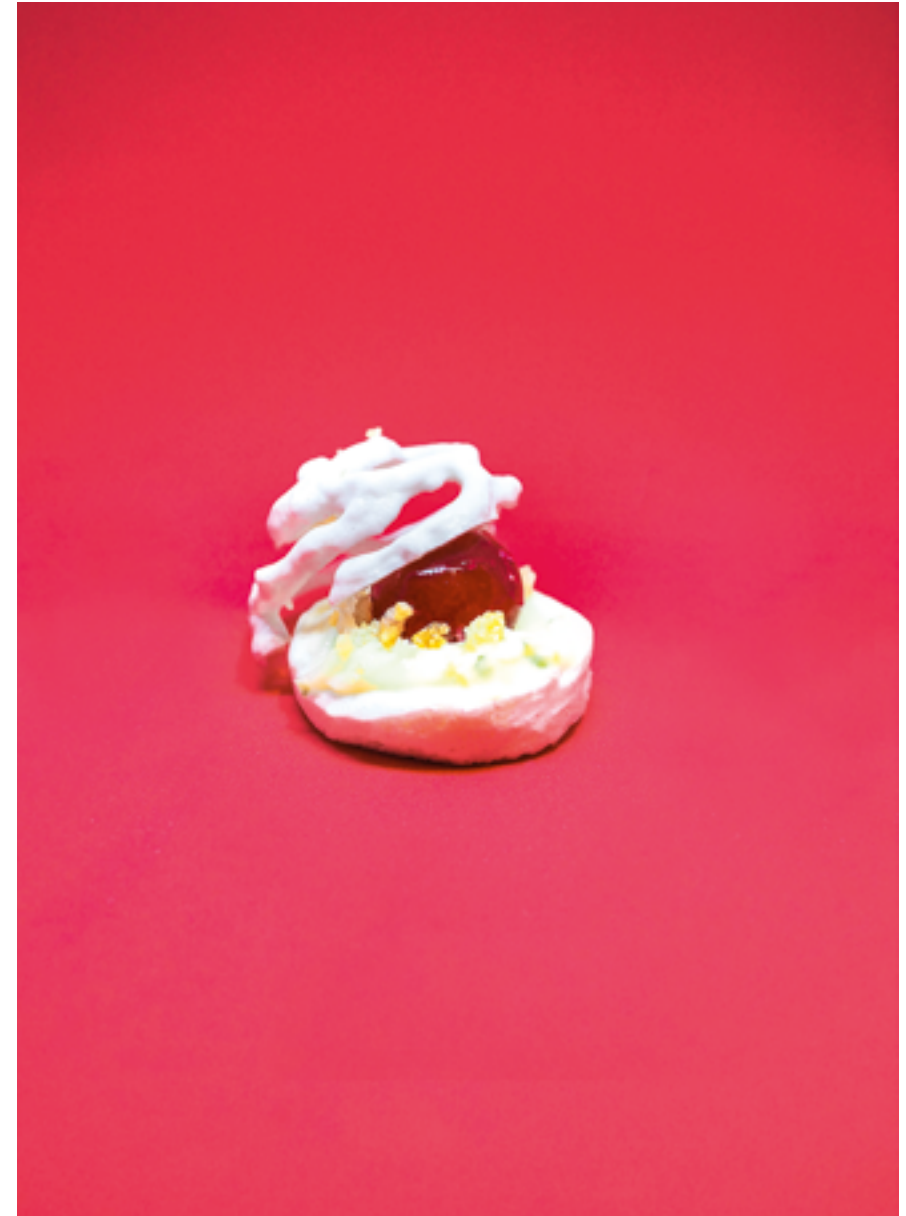
Neru: Getting up Healthy

Attention is one of the most important currencies of the 21st century. It is the basis of many digital business models. Yet it is becoming evident when we go to bed too late and emotionally drained that the needs of the user are not always at the center of attention-demanding services. Neru provides a way to create and maintain a healthy bedtime routine, giving an initial trigger and guiding the user through their evening routine. It taps into unwinding techniques in order to reduce stress and anxiety, eases the transition from wakefulness into sleep, and cultivates a sense of balance and well-being. As a connected ecosystem consisting of a portable hourglass and multiple docking stations, Neru is with you during your routine, communicating with other IoT devices and creating a supportive environment in which bedtime becomes the main focus.

Unfold

UTwente

Tim Velthuis
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Many people on the autism spectrum experience anxieties about new or unknown places, which can have a big impact on their daily lives. Unfold is a concept that specifically targets young adults with agoraphobia to help them develop more independence in part by "previewing" unknown spaces through a connected device. By facilitating a more accessible way of exploring new places, Unfold motivates users to expand the area that they feel comfortable in. Design decisions were derived from an in-depth co-design process featuring multiple sessions with an autistic individual in collaboration with the design agency Panton and the child and youth psychiatric center Karakter.