

# VÄLK

# + ALEXELA

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Supervisors: Martin Pärn, Ruth-Helene Melioranski



Välk's arm position.



Välks charging.

## VÄLK – THE EFFECTIVE SWITCH

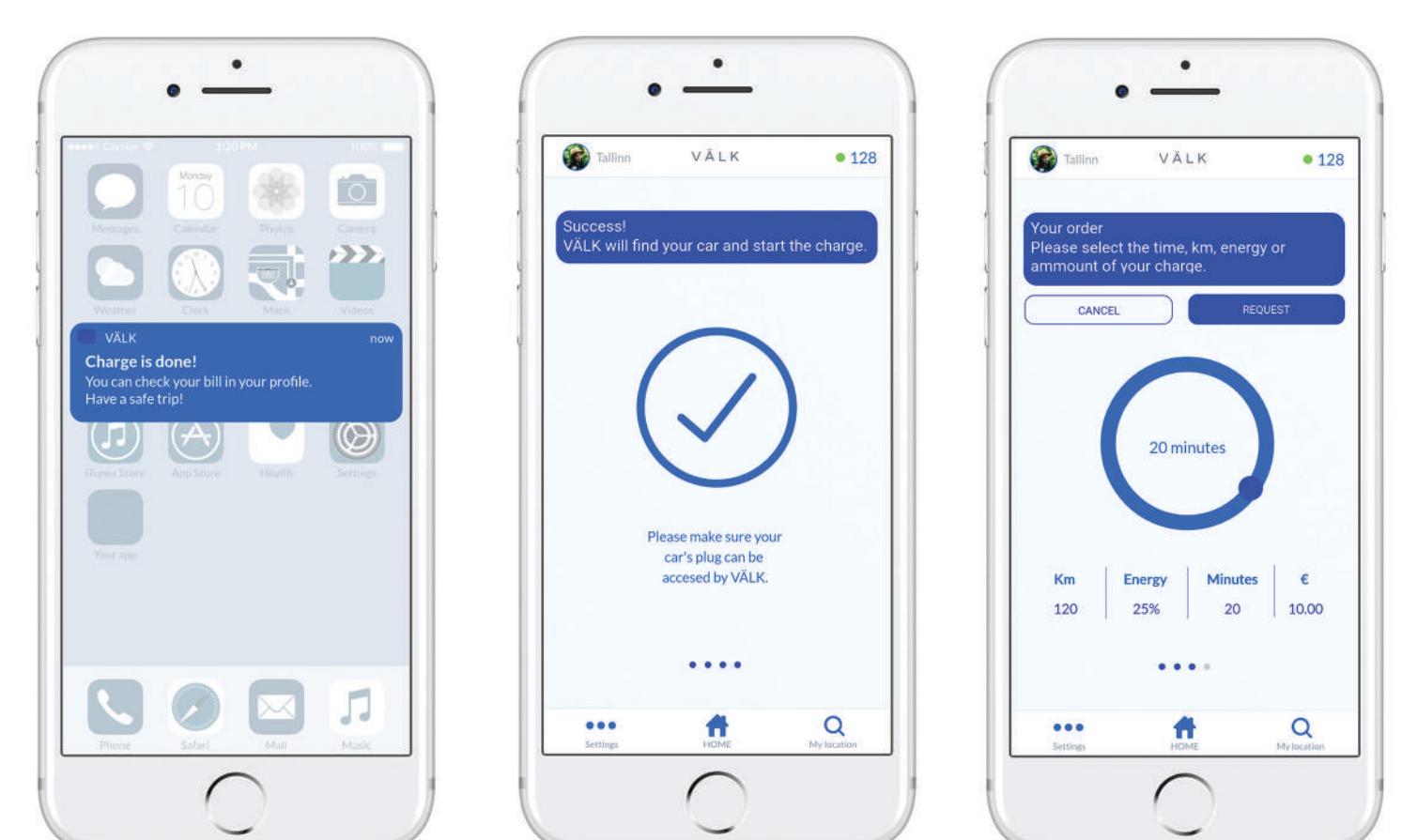
Välk is an autonomous charging assistant that charges electric vehicles wherever they are parked, making them responsive instead of powered down when not in use. Although discreet and simple, Välk powerfully and efficiently completes the task it was designed to do: transferring power to cars.

Using an optimized dc-dc power control and delivery mechanism, Välk can deliver around a 100km charge range in 25 to 30 minutes.

The on-board charge controller monitors the current flow making the synergy robust and quick. The mobile app is used to remotely book or call a Välk, to choose range, duration, maximum cost and energy, and to stop the charge if needed. Välk works by plugging itself in and out of the vehicle autonomously, notifying the user when the charge starts and ends.



Välk working.



Välk mobile app.



# VELEV

# + ALEXELA

Team: Martti Rosenblatt, Grete Pärtel, Alise Lezdina  
Supervisors: Martin Pärn, Ruth-Helene Melioranski



## VELEV – OUTDOOR CHARGING AND LOCKING NETWORK FOR LIGHT ELECTRIC VEHICLES

People use public and private transport throughout the city in their daily commutes. We want to offer a more efficient and healthier solution for getting around from points A to B that would supplement the existing traffic network. Building on trends like sustainability and electrification, and based on the needs of society, we see opportunities for developing a charging and locking network for light electric vehicles like e-bikes, e-kick-scooters, e-skateboards, e-wheelchairs.

VeleV is an all-in-one outdoor charging and locking system for light electric vehicles that adapts to the future changes in the city. The outdoor charging solution is offered as a network throughout the city, with many charging locations. The solution is provided with the RoPD (Rosenberger Power Data Connectors) plug, which has a magnetic connecting system and is suited for data communication and power transmission. You can lock your light electric vehicle and charge it with the same cable, as well as utilise the anti-theft function as it has a self-locating function upon charging.

In the future, it could develop into a city-scale outdoor electricity provider for people with any light electric vehicle as well as for robots and drones.





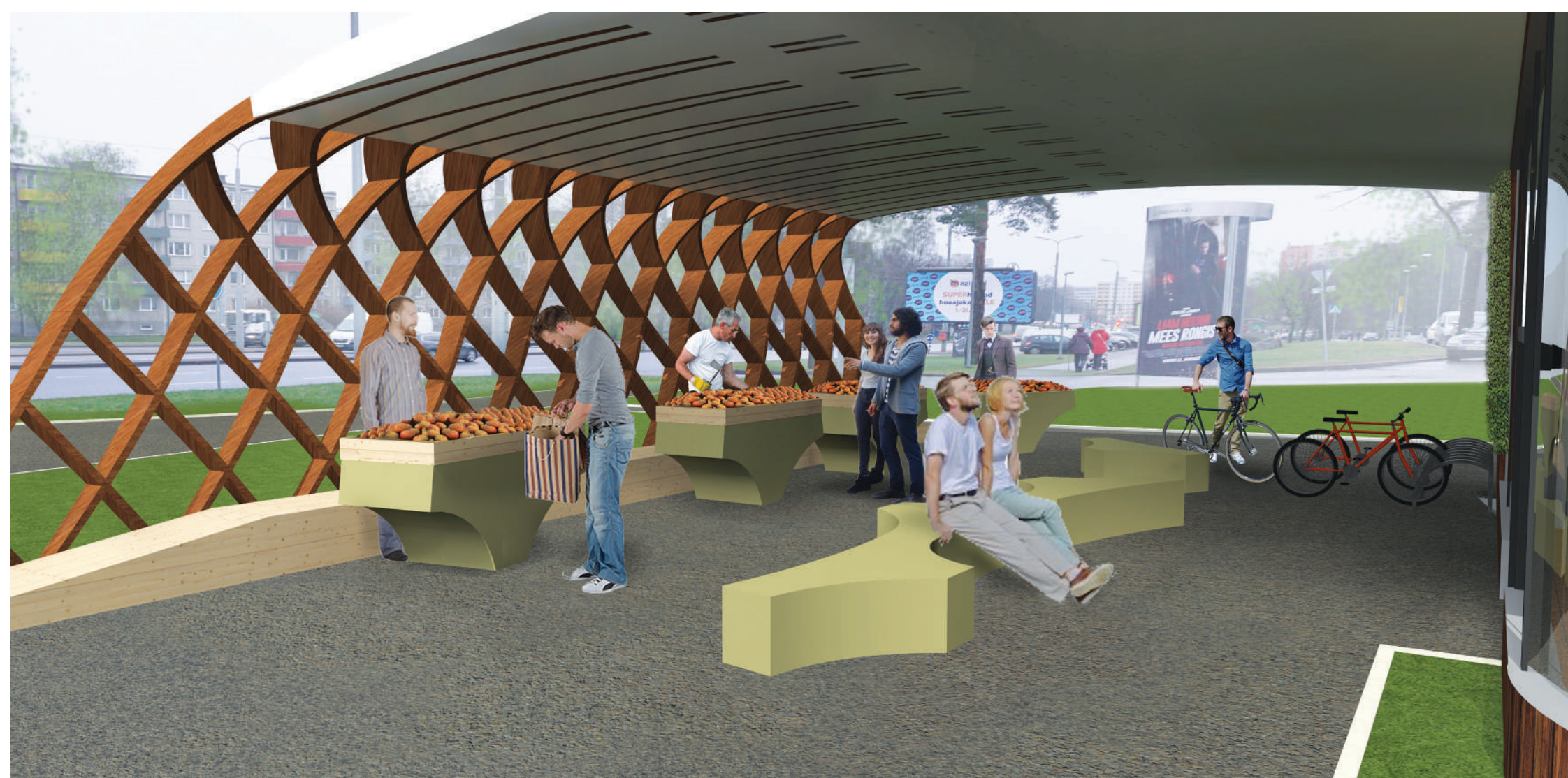
# ALIVE

# + ALEXELA

Team: Omar Olivares, Vlad Shvets, Volkan Göktürk  
Supervisors: Martin Pärn, Ruth-Helene Melioranski



Alive Station



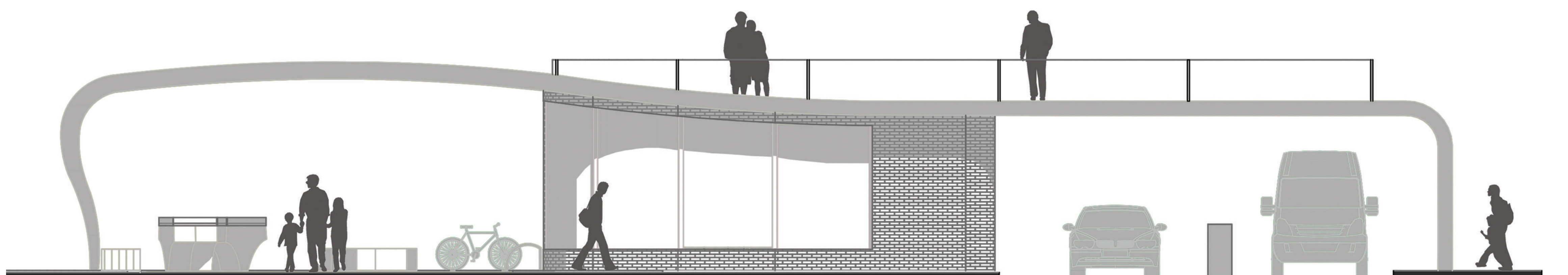
Alive Station Market

## ALIVE

Alive is the next generation station, a new type of station focusing on community and the people living in the neighborhood, redesigned and modified with the community's needs in mind, considering their activities and their interests.

Alive is a gathering point for the people who are otherwise left out since current stations are oriented around cars and drivers. It is a place where you can pass time, relax, organize events, or just meet fellow inhabitants in a flexible space for activities all year long.

The architectural look blends into the cityscape of the community where it is located. Envisioned with urban trends, Alive bears a new architectural look. It contains green walls, colors and soft lines, so that it is visually appealing for all. It is inviting, ecological, yet stays true to its original purpose.



Fasad



# WAKE

Team: Sophie Farine, Mariana Hint-Rääk, Dinukshie Nirmanie Gunaratne  
Supervisors: Martin Pärn, Ruth-Helene Melioranski

# + SKELETON TECHNOLOGIES

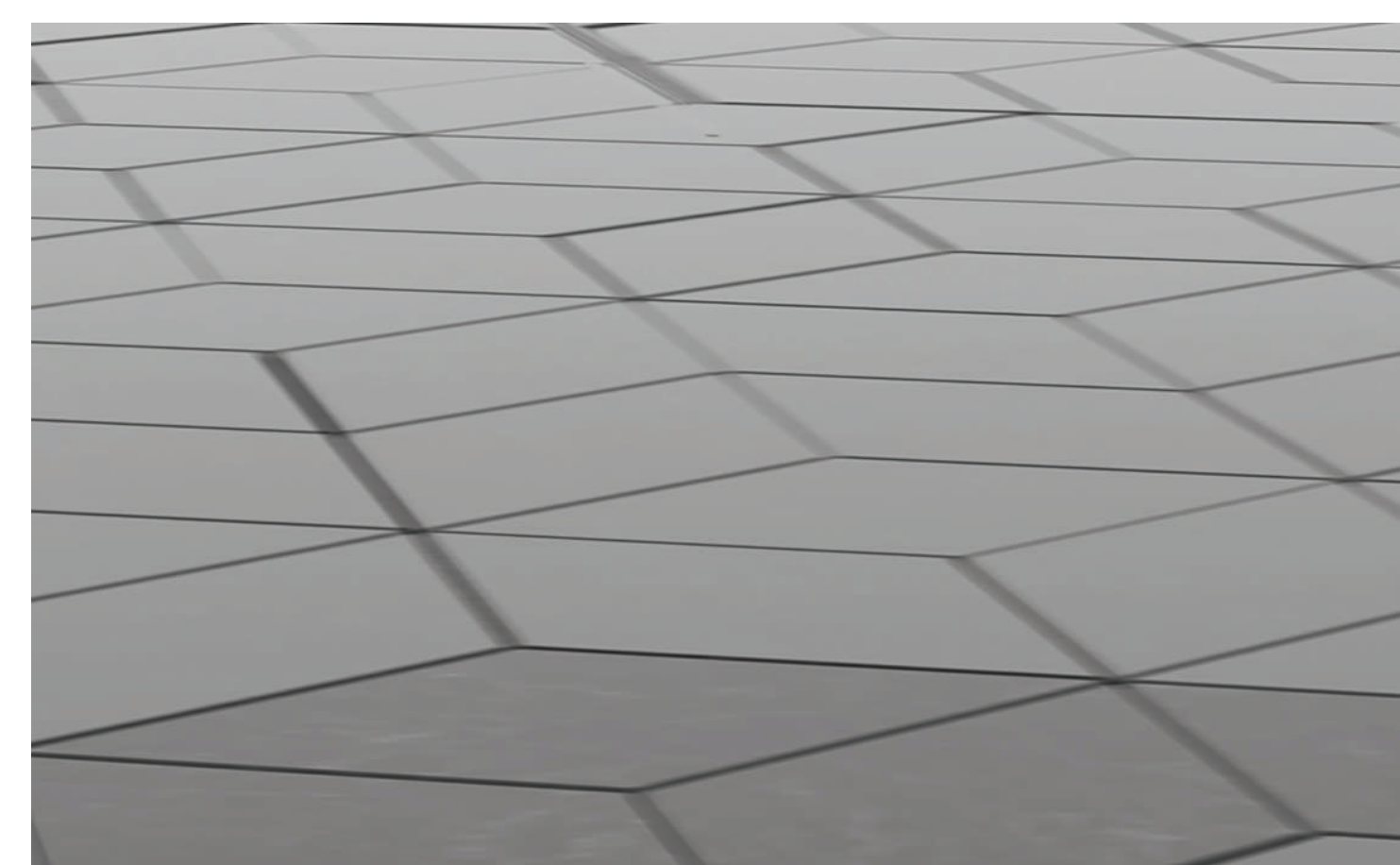


## WAKE – A SMART MOBILITY PLATFORM

According to ASIRT (2018), nearly 1.3 million people in the world die in road crashes every year. Knowing this, do you always feel safe on the road? WAKE is a smart mobility platform that transforms a road into an intelligent and reactive environment. This creates an enhanced road experience by increasing the interaction between the road and those commuting.

Road surfaces embedded with morphing design elements transform and adapt to different situations based on real-time data collected by sensors.

Tilted tiling surfaces warn speeding drivers to stay within the regulated speed limits. Tiling with LED elements gives a visual warning or an on-demand reminder at pedestrian crossings, road-construction sites and emergency road diversions.





# SCALEWAY

Team: Liina Vaino, Carol Rennebaum, Juan Francisco Balcazar Bartra  
Supervisors: Martin Pärn, Ruth-Helene Melioranski

# + SKELETON TECHNOLOGIES



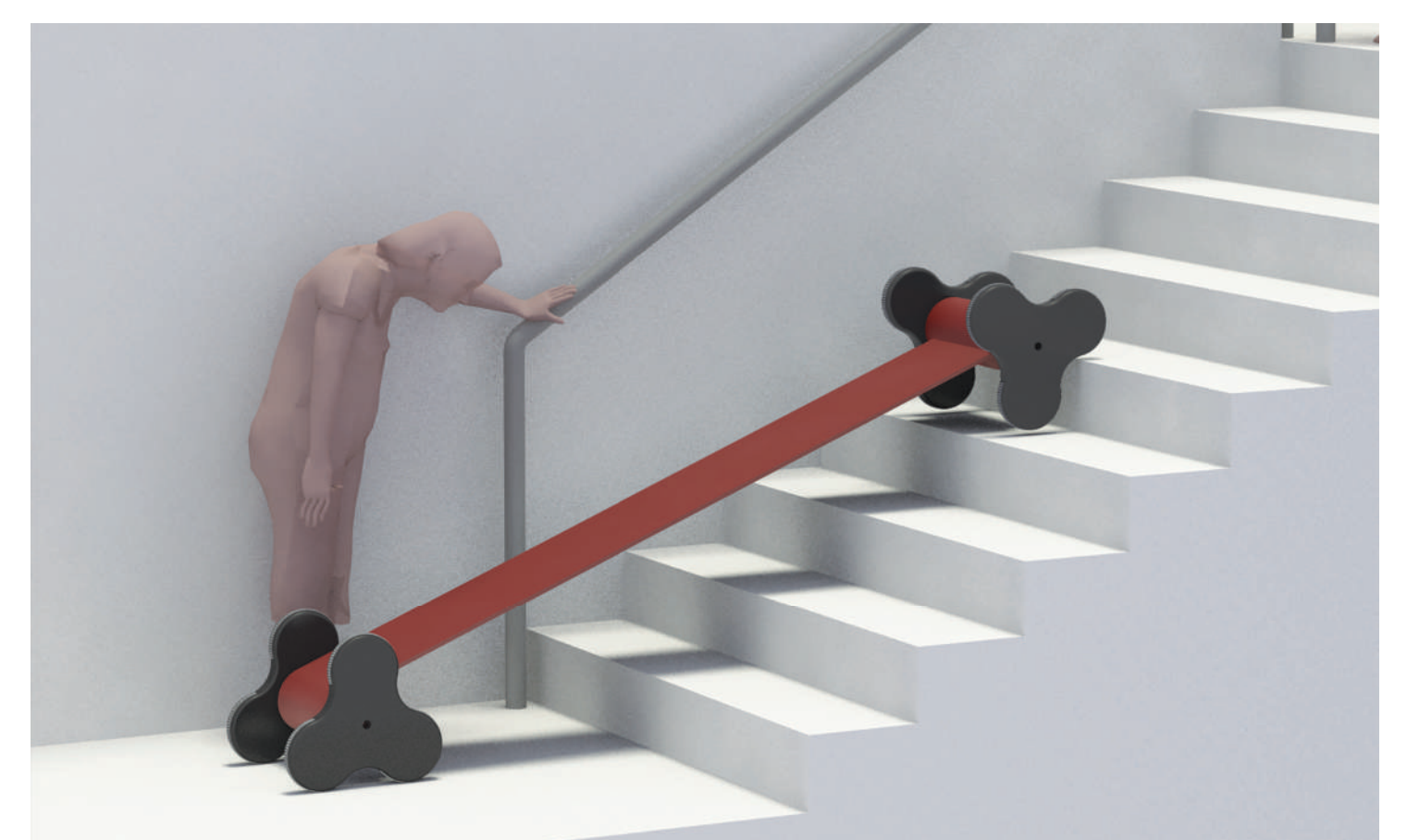
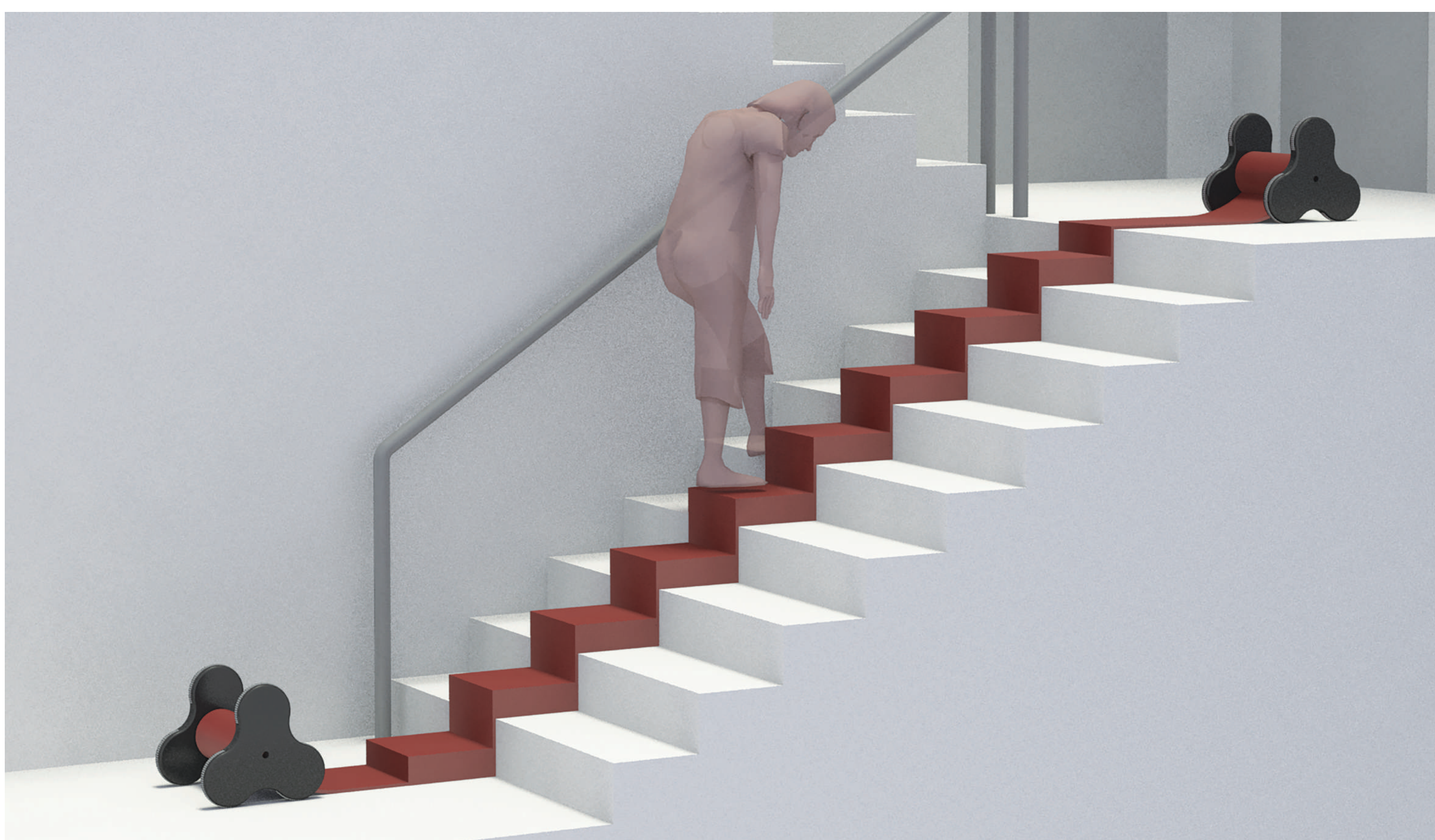
## SCALEWAY

Scaleway is a mobile electrical climbing aid that provides a more pleasant way up and down the stairs for people with limited mobility.

Average levered stairways are no longer obstacles, as this designed aid reduces the height of each step by half. Scaleway detects measurements of an existing stair and rolls itself out like a carpet, creating an elevated surface to step on.

Scaleway has two sets of stair climbing wheels, two tubes with motors and a flexible rollout carpet that can be rolled onto either of the tubes. The inner skeleton of the carpet is made of linear scales connected and operated by lateral, electric smartstrings. Different heights for various stairs are achieved by adjusting the angle of the scales.

Scaleway follows the user on his or her way up or down the stairs and charges itself wirelessly using ultracapacitors.





# SKADI

Team: Yunus Emre Ayaz, Karin Vene, Ilgar Akbarov  
Supervisors: Martin Pärn, Ruth-Helene Melioranski

# + SKELETON TECHNOLOGIES



## SKADI – A NEW WAY OF SKIING

Skadi is a new intelligent service platform that makes your mountain skiing experience unforgettable. While it brings the ultimate fun and competition to the mountains and offers a unique skiing experience. Skadi is also reliable through the roughest winter conditions on the slopes, with the help of ultracapacitor technology.

Skadi consists of goggles, earphones and a vest. A multisensor-equipped vest gives beginners instant feedback about correct posture and body alignment, along with the ability to measure data such as speed or alert the skier about the surroundings. Competent skiers can play a variety of games thanks to the smart goggles and earphones. Within augmented reality, they can choose to be James Bond or collect points on the way down and compete with friends!

Skadi uses a rechargeable ultracapacitor as an energy unit. It can be recharged on every recharging station near ski lifts with an easy plug-in recharge option. Users can choose the game they would like to play on the interactive screen on their way to the top.

Skadi presents a challenge to experienced skiers, as well as an opportunity to learn for beginners.





# DESIGN & ENGINEERING

Today's set of complex problems from one side and fast developing technologies offering ever new possibilities on the other side create a dynamic and demanding setting for possible innovations. This is the playground of Design & Engineering. In this joint international Master's program of the Tallinn University of Technology and the Estonian Academy of Arts, students with different backgrounds work in interdisciplinary and multicultural teams, explore and describe complex, real-life challenges and create new concepts by following design-driven innovation methodology. We aim to translate people's changing needs and behaviours into tech-intensive new product and service ideas, which offer insights for our partners.



## POWERING TOMORROW

The way we live, act and behave is all supported, guided and fed by ubiquitous energy systems, mostly invisible to our eyes and minds. Energy technologies are rapidly changing, creating pathways for new applications and possibilities for rethinking interactions with the man-made world.

Design & Engineering student teams partnered with Skeleton Technologies and Alexela to explore how to shift our understanding of energy – from invisible support to meaningful power for the future.

Powering Tomorrow course supervisors: Martin Pärn, Ruth-Helene Melioranski