

# The Smart Walker

Bringing elderly people together using technology that feels natural and unplanned.

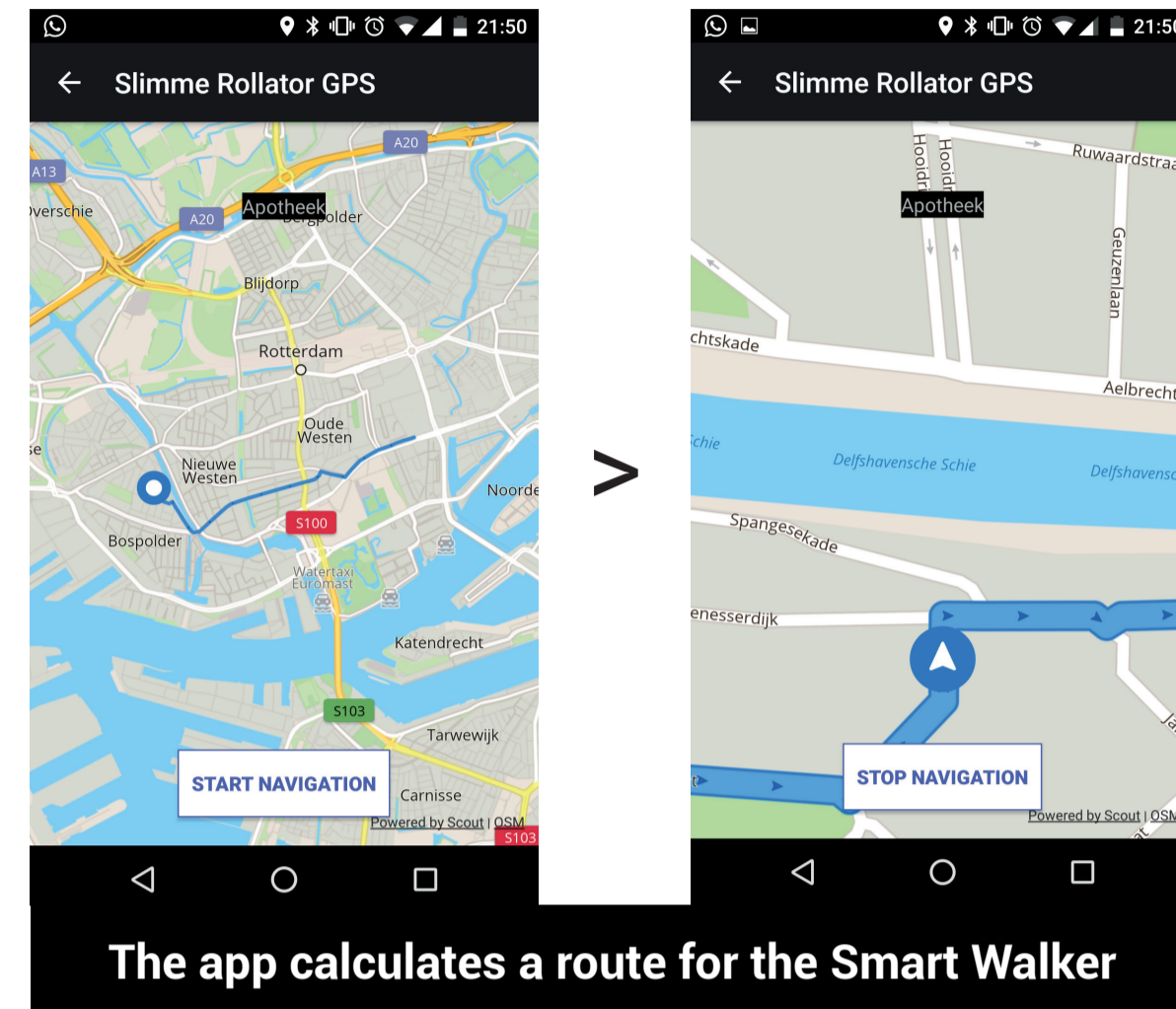


The user selects a location on the Smart Walker

## How does it work?

The Smart Walker has a vibration motor in each handlebar and the user is guided towards a specific location through vibrations. If vibration is felt on the right handlebar the user takes a right turn, if it is felt on the left handlebar, the user takes a left turn.

The user selects a predefined location using the gear attached to the handlebar. On the e-ink display the user is able to see what the selected location is. The e-ink display is clearly visible under every weather circumstance.



The app calculates a route for the Smart Walker

## How does it generate routes?

The current prototype works with Bluetooth, Arduino and the Smart Walker app for Android. A location is selected by the Smart Walker handlebar and the Android app will generate a route using the Skobbler API and guide the user where to go.

The next step is to add the ability to guide users through popular routes so the elderly are more likely to run into each other. Based on the weather it will generate different routes as well. Adding the ability to manage the locations is also a must have.



The Smart Walker generates routes where users are more likely to run into each other

## 1) Context

In the multicultural and low income neighborhood of Hillesluis in Rotterdam, 27% of elderly residents are lonely (Gemeente Rotterdam, 2014). EMI op zuid and the council of Rotterdam want to improve the social life of the elderly in Hillesluis. EMI op zuid and the council of Rotterdam want to create a sustainable and low maintenance project. Improving the social lives of the elderly will give them a longer life span, more confidence and better mental health. (S. Karger AG, 2015)

In the first half of the project time was spent doing various types of desk and field research, to create a good base for the concept. **The goal of our project is to raise confidence and improving independence of the elderly by adjusting an everyday object.** (The Guardian, 2003) (Gartner, 2014) (The Guardian, 2014).

Inspired by the walker we wanted to give the user more confidence to go out of their homes and meet new people. By creating a Smart Walker that will guide people to each other without the user being forced to interact, we hope to help build friendships.

We have tested the prototype two times and focussed on the following:

- The usability of the Smart Walker on different surfaces, are the users able to feel the vibrations in the handlebars?
- Do the social interactions created by the smart walker feel natural and unforced.

## 2) Approach method

The final step for the Smart Walker prototype is entering a destination into the Smart Walker. Entering a destination into the Smart Walker must be a very simple task for the user, from the idea that the user knows what's best. (Sleeswijk, 2005)

At Delta Rotterdam Zuid a co creation session was hosted. The goal of session was to let the elderly design the best way to enter a destination on the Smart Walker. A week before the co creation session started the participants had some homework to do. The participants were given a map where they had to draw on area's where the participants would like to go and where they actually went. The participants had a week to complete this assignment.

The co creation session had the following program. At first the participants had to show each others maps and talk about the locations they would like to go to. The next step was to create a handlebar where the user can select a location from. The participants were given the following tools each: a big piece of clay and lasercut wood shapes of buttons, screens and a bike gear.

The participants had to come up with the best way to select a destination on the Smart Walker. After the participants were done creating their concepts they had to present their ideas to each other.

## 3) The co creation results

The co creation session didn't go as planned. The homework assignment was not completed by everyone and there were many attendants. The decision was made to let all attendants create their own destination picker for the Smart Walker. 7 participants were active in the co creation session.



Interaction created by the Smart Walker



"It works like a travel guide"



"Where should I put the screen?"



"What is the best position for the buttons?"



The 7 creations by the elderly

The new found insights of the session were the following:

- A home button on the handlebar that will take the user back home.
- Caregivers and family could be able to see where the elderly is walking with the Smart Walker
- The handlebars ergonomics are different for every elderly, each participant put the screen and the buttons in a different place. A new test session will be held to determine the best position of the button.

## 4) Building the latest version of the Smart Walker

The latest prototype is adjusted to the demands of the user, destinations are selected through a bike gear component and there's an e-ink display attached that gives you accurate information about your whereabouts. The handlebar also contains a home button that will send the user home.

The Smart Walker works with an Arduino and a custom made Android app. The Arduino has a bluetooth component that communicates with the Android phone. The Android app calculates the route using the skobbler API and sends instructions to the Arduino. When a user selects a destination the Arduino sends this to the Android phone.

## 5) Conclusion

By letting the future users design a part of a product they have better understanding what the product is made for and how they can influence the design.

Building the final part of the prototype was a difficult challenge, luckily the Skobbler API came to the rescue. The Skobbler API generates a route for the Smart Walker and gives the Arduino instructions. The communication between the Arduino and Android was quite challenging as well. Receiving the input from the Arduino on the Smart Walker app was challenging.

Our latest prototype works, but you still have to give the user a lot of instructions. This is the biggest drawback of the current prototype.

We've also had interest from dare to care a company that made a walker bike. They want to implement our navigation system onto their walker bike.

## 6) Future Work

The Smart Walker needs to be tested again with the future users in order to make a new improvement. Does the new addition of selecting a location to go to really work? This needs to be tested with future users out on the streets. Based on the new given feedback a new iteration could be made.

Another requirement is to add the ability to add new locations and manage locations on the smart walker with a mobile app or website. Elderly, family and caregivers can add these new locations to the user's Smart Walker. A new webservice needs to be built to provide these services. Implementing this feature will require a lot more use cases and a lot of testing.

The currently least interesting next step would be to implement the feature that caregivers and family would be able to see the whereabouts of the Smart Walker user. This would require a webservice that would log where the user is and send out a notification if the user seems lost or not moving for a long period of time.