

THE **STICK**

Beant Dhillon | Ioannis Politis | Jorge Peregrín Empanza
Multimodal interaction | USI program 2009 | TU/e

Domain

Navigation
A common interface design problem

Design

But!

Tasks

Navigation for the blind
Unexploited opportunities

Scenario

Limited Research regarding optimal Input/Output modes

Discussion

Exploratory Navigation not addressed too much

Integration of devices with everyday life products of blind

A limitation of interface or technology?





Domain

Simple interactions, big benefits.

Design

Low cognitive load

Tasks

Easy information access

Scenario

Discussion



THE **STICK**

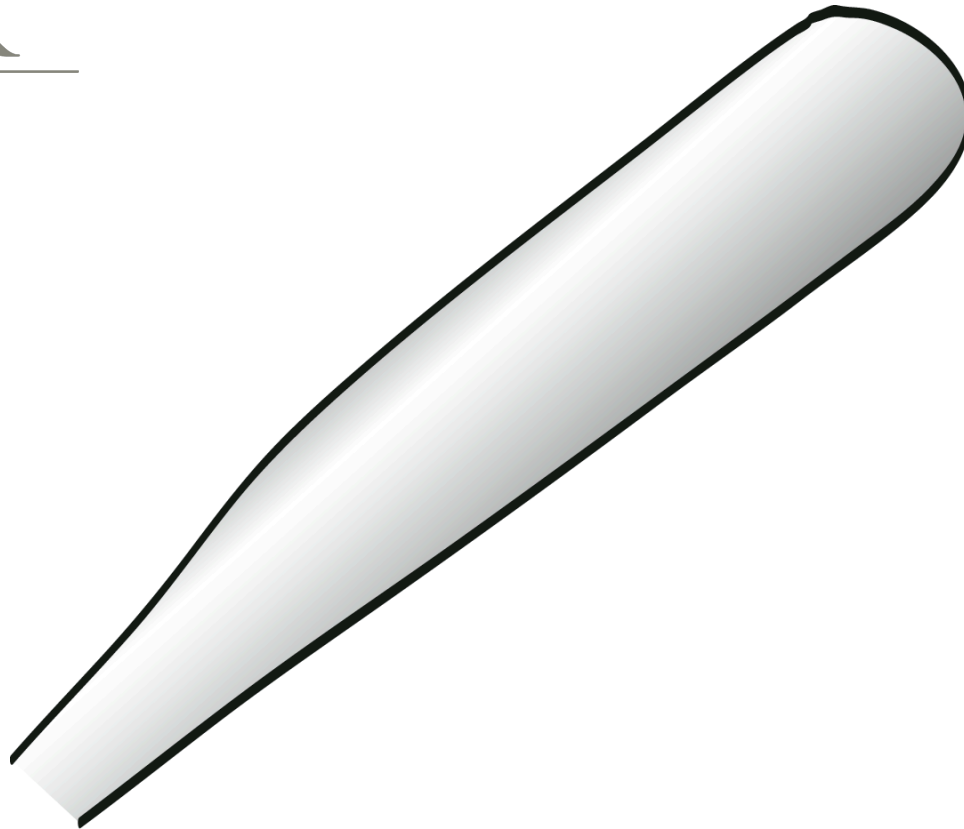
Domain

Design

Tasks

Scenario

Discussion



Beant Dhillon | Ioannis Politis | Jorge Peregrín Empananza
Multimodal Interaction | USI program 2009 | TU/e

THE **STICK**

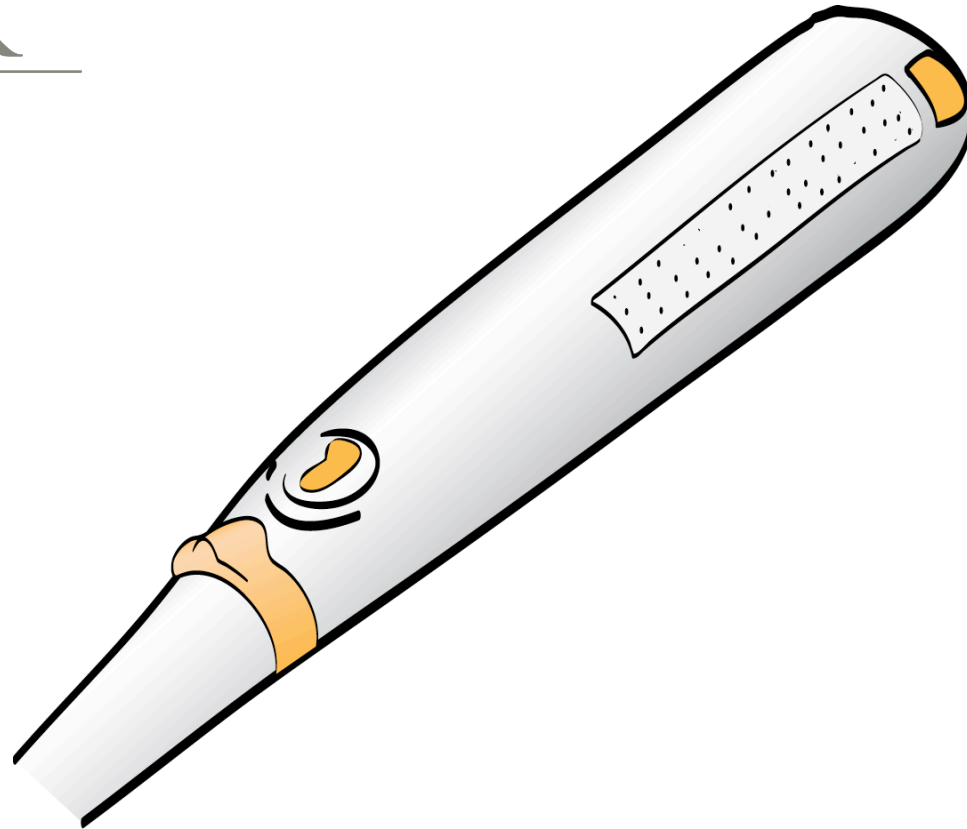
Domain

Design

Tasks

Scenario

Discussion



Beant Dhillon | Ioannis Politis | Jorge Peregrín Emparanza
Multimodal Interaction | USI program 2009 | TU/e

THE **STICK**

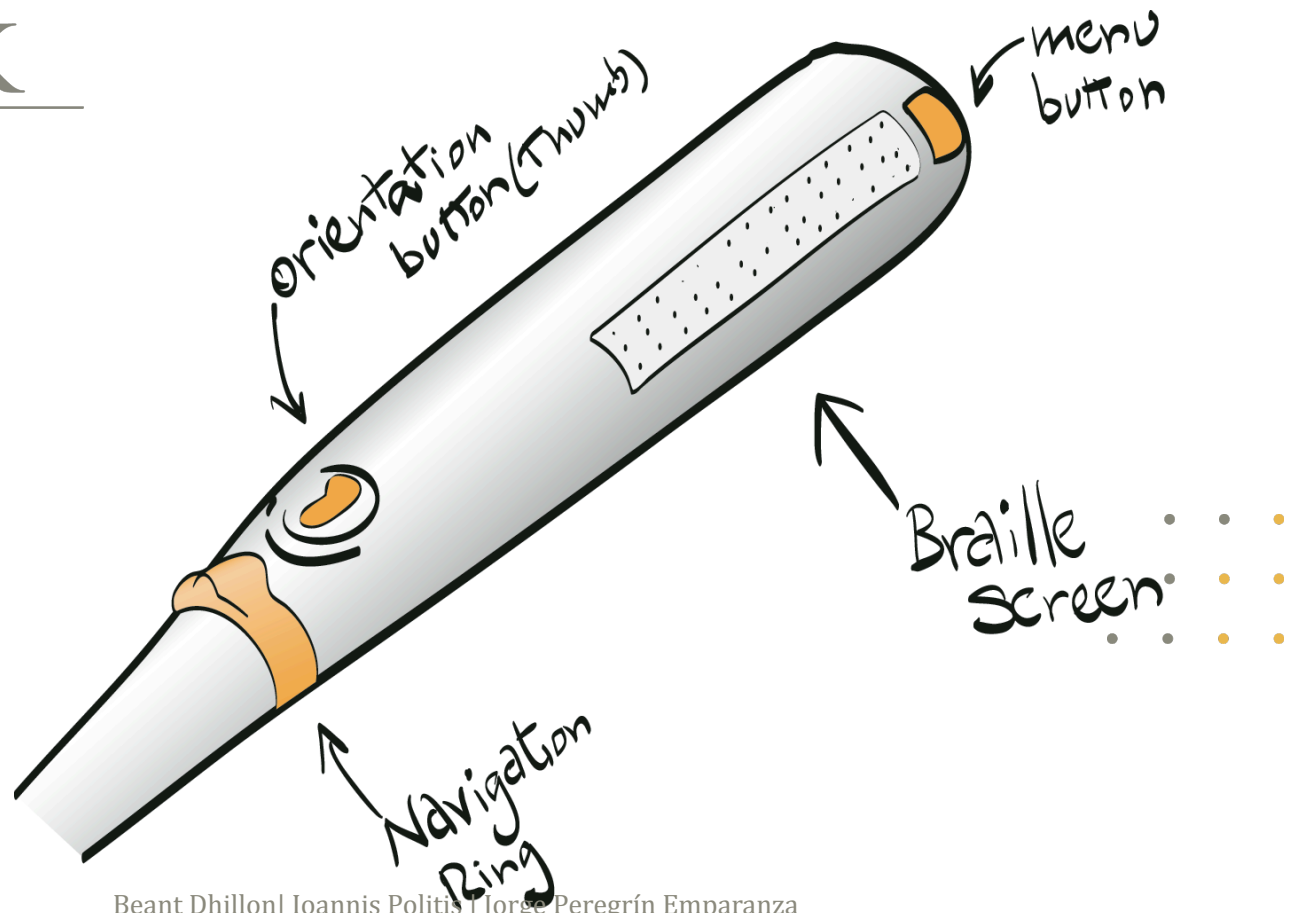
Domain

Design

Tasks

Scenario

Discussion



Domain

INPUTS

Microphone

Design

A ring for menu choices
Back/Previous | Forward/Next
Cancel | Confirm

Tasks

Scenario

OUTPUTS

Audio
Speakers

Discussion

Tactile Output
Braille Display | Direction Arrow



THE **STICK**

One hand control **on the go**

Domain

Tactile output: movement, vibration, Braille.

Design

Audio output: options, feedback.

Tasks

Voice input for complex input.

Scenario

Tactile input for simple input (buttons)

Gesture for quick-commands and more

Discussion



Domain

Design

Tasks

Scenario

Discussion

3 items menu:

Landmark

Preset destination

Find destination



Domain

Design

Tasks

Scenario

Discussion

3 items menu:

Landmark

Preset destination

Find destination



Domain

Program Favorite Routes

Design

Retrieve Routes

Record comments about points of interest

Tasks

Bookmark points of interest

Scenario

Browse a route in *audio/ braille display* form

Discussion

Receive *alerts* while on-the-move

e.g. repairs| traffic jams



THE **STICK**

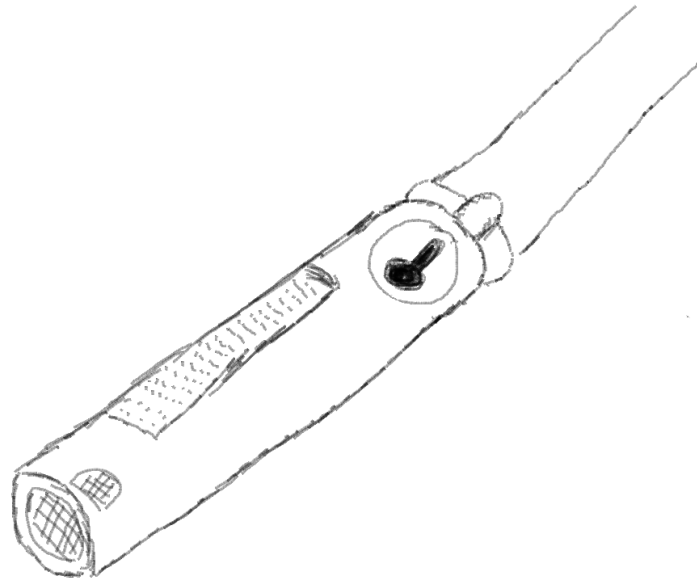
Domain

Design

Tasks

Scenario

Discussion



THE **STICK**

Domain

Design

Tasks

Scenario

Discussion



THE **STICK**

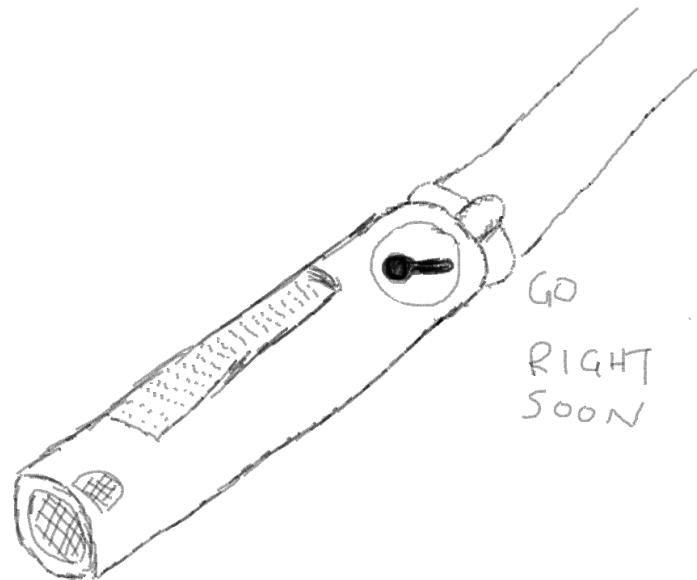
Domain

Design

Tasks

Scenario

Discussion



THE **STICK**

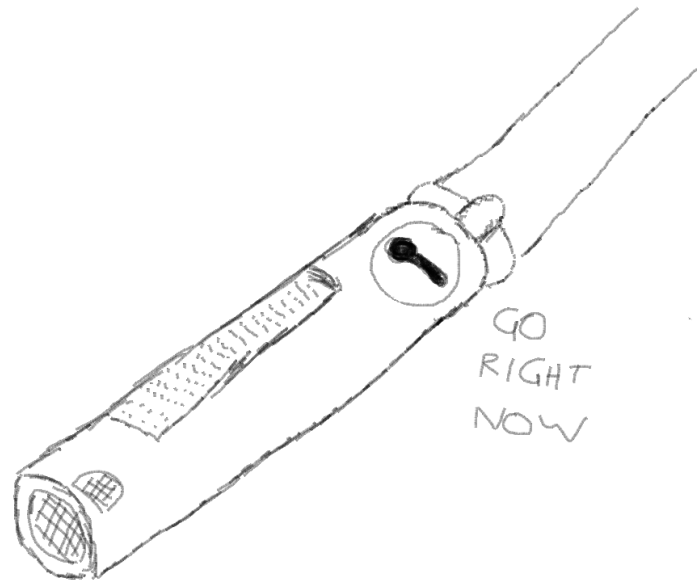
Domain

Design

Tasks

Scenario

Discussion



THE **STICK**

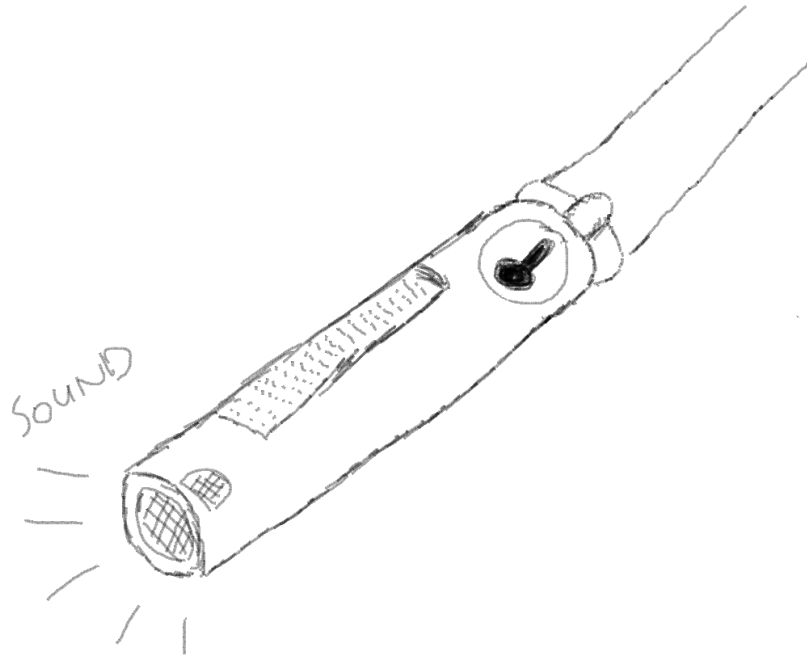
Domain

Design

Tasks

Scenario

Discussion



THE **STICK**

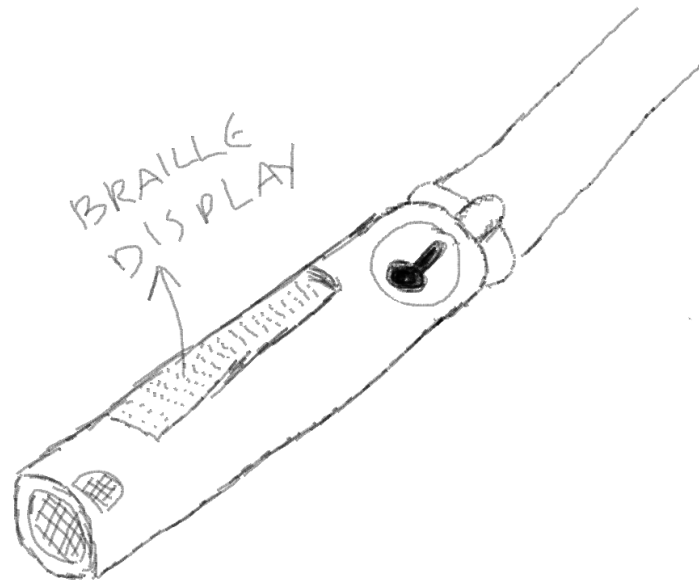
Domain

Design

Tasks

Scenario

Discussion



THE **STICK**

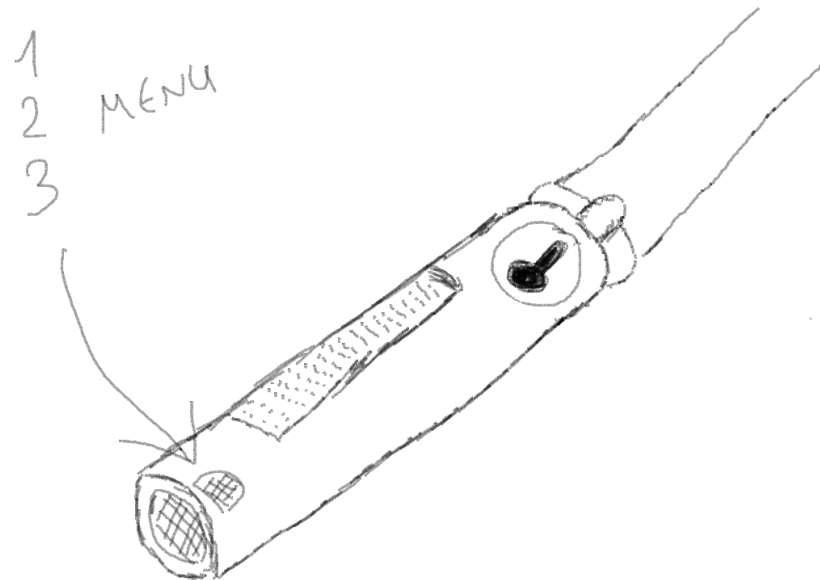
Domain

Design

Tasks

Scenario

Discussion



THE **STICK**

Domain

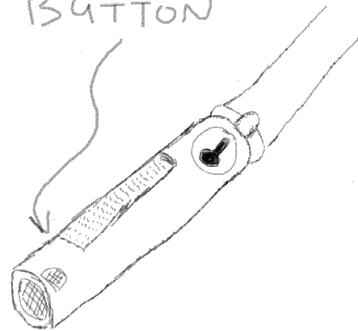
Design

Tasks

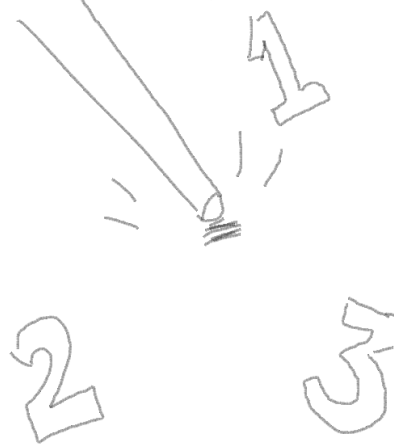
Scenario

Discussion

WHEN PRESSING
THE "MENU"
BUTTON



TAP TO
SELECT



THE **STICK**

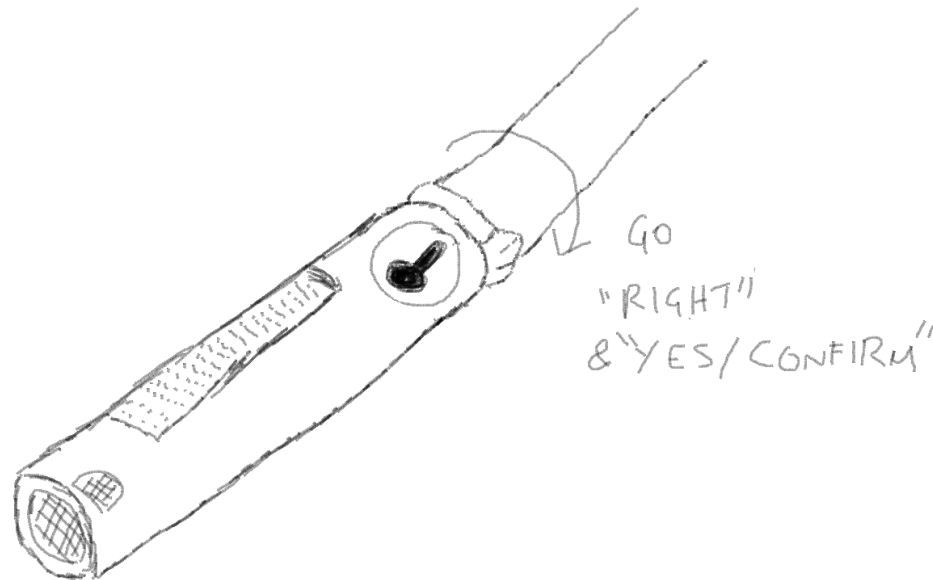
Domain

Design

Tasks

Scenario

Discussion



THE **STICK**

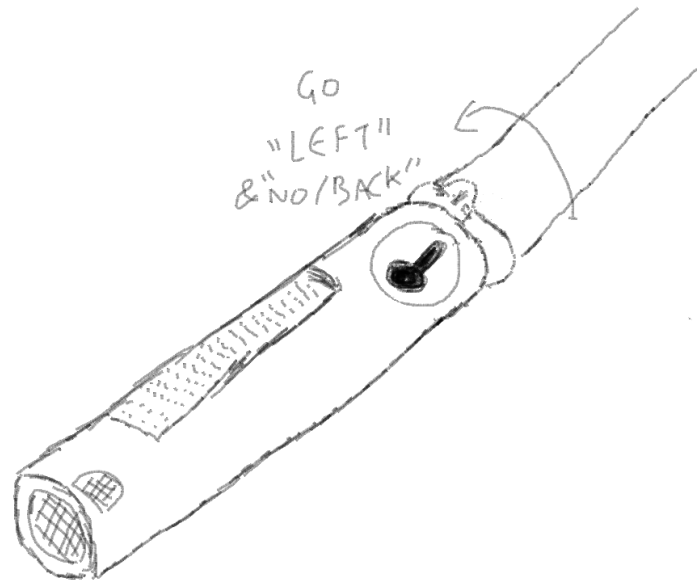
Domain

Design

Tasks

Scenario

Discussion





Domain

Design

Scenario: **Tom and the Stick** in a normal evening.

Tasks

Scenario

Discussion



THE **STICK**

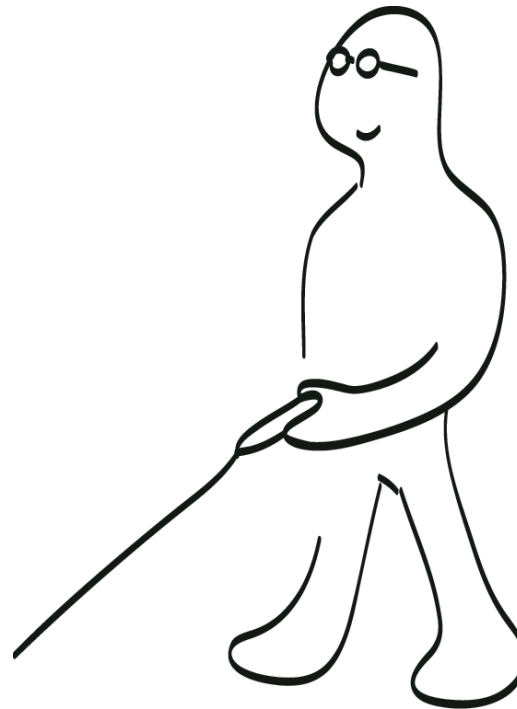
Domain

Design

Tasks

Scenario

Discussion



Tom is blind and independent.

Domain

Design

Tasks

Scenario

Discussion



Dinner @ Mark's place

THE STICK

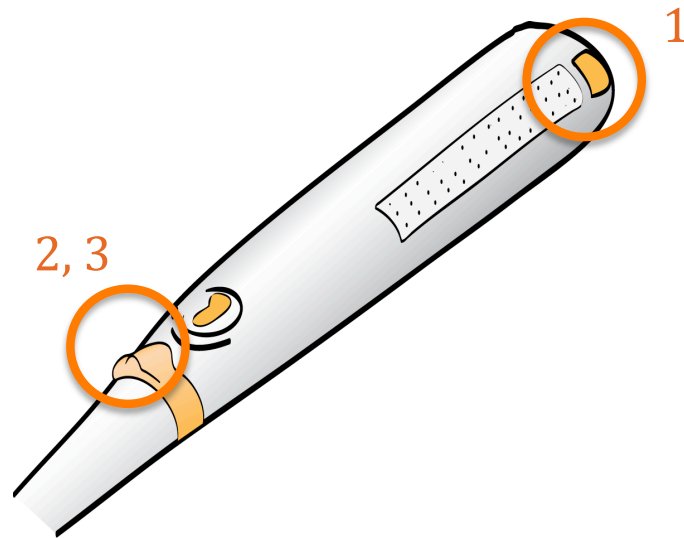
Domain

Design

Tasks

Scenario

Discussion



Activates the **menu** / select “*preset destination*” / select “*Mark’s place*”.

The Stick confirms: “*going to Mark’s*”

THE **STICK**

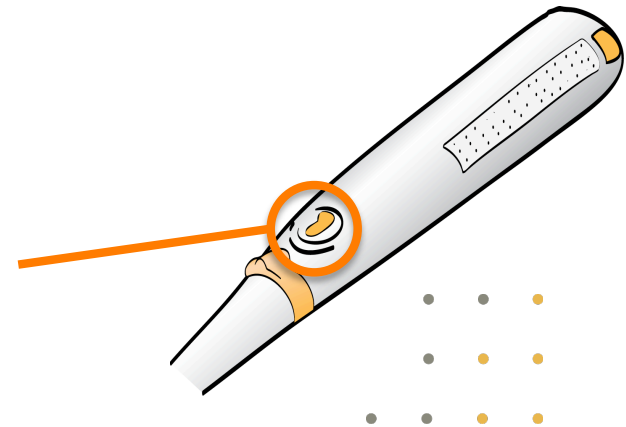
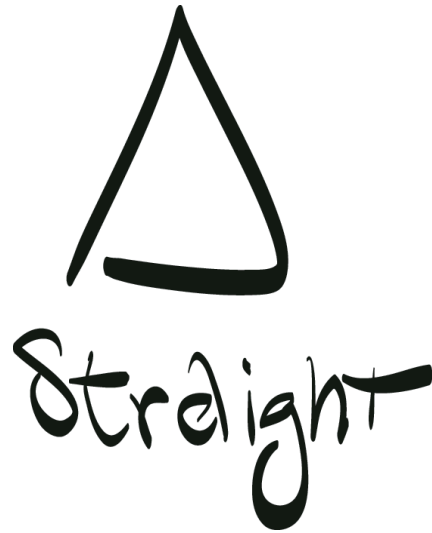
Domain

Design

Tasks

Scenario

Discussion



The Stick guides Tom along the way....

Beant Dhillon | Ioannis Politis | Jorge Peregrín Empananza
Multimodal Interaction | USI program 2009 | TU/e

THE **STICK**

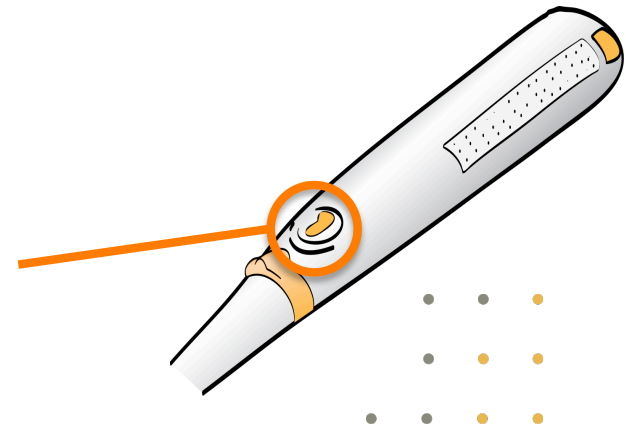
Domain

Design

Tasks

Scenario

Discussion



The Stick guides Tom along the way....

Beant Dhillon | Ioannis Politis | Jorge Peregrín Empanza
Multimodal Interaction | USI program 2009 | TU/e

THE **STICK**

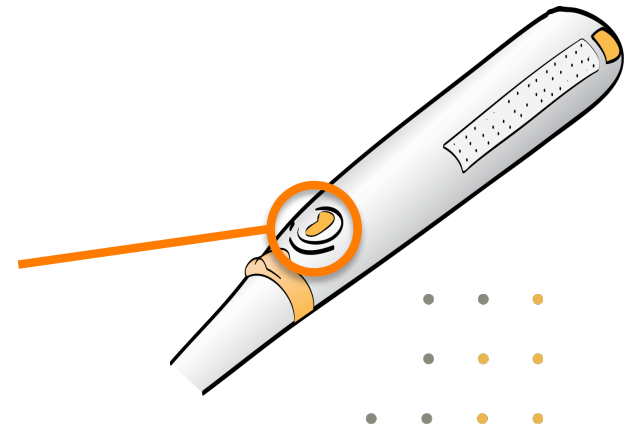
Domain

Design

Tasks

Scenario

Discussion



The Stick guides Tom along the way....

Beant Dhillon | Ioannis Politis | Jorge Peregrín Empanza
Multimodal Interaction | USI program 2009 | TU/e

THE STICK

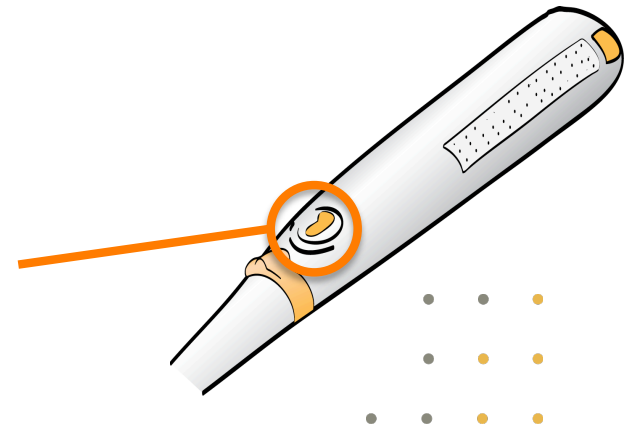
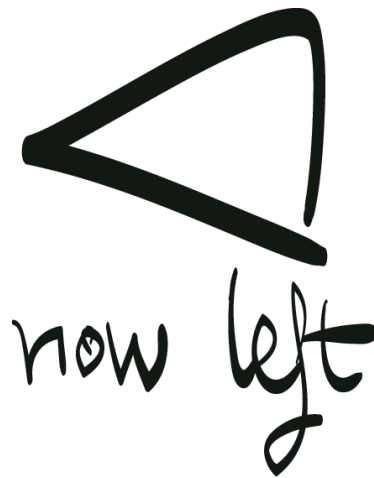
Domain

Design

Tasks

Scenario

Discussion



The Stick guides Tom along the way....

Beant Dhillon | Ioannis Politis | Jorge Peregrín Empanza
Multimodal Interaction | USI program 2009 | TU/e

THE **STICK**

Domain

Design

Tasks

Scenario

Discussion



Domain

Design

Tasks

Scenario

Discussion



Speaker: "Rain is expected in the area in about an hour".

Beant Dhillon | Ioannis Politis | Jorge Peregrín Empanza
Multimodal Interaction | USI program 2009 | TU/e

Domain

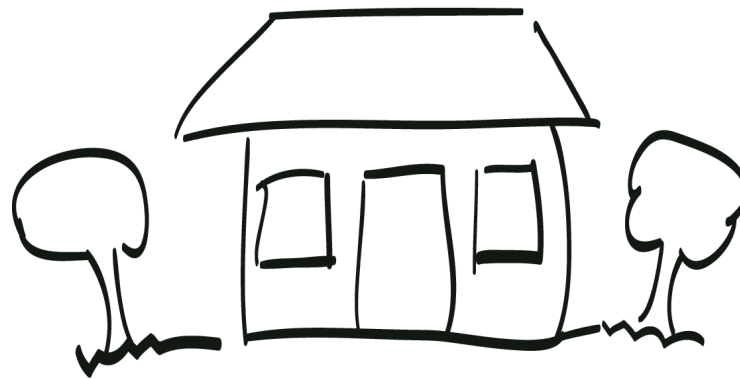
Design

Tasks

Scenario

Discussion

HOME



Quick access to preset destination by gesture

Beant Dhillon | Ioannis Politis | Jorge Peregrín Emparanza
Multimodal Interaction | USI program 2009 | TU/e

THE **STICK**

Domain

Design

Tasks

Scenario

Discussion



THE **STICK**

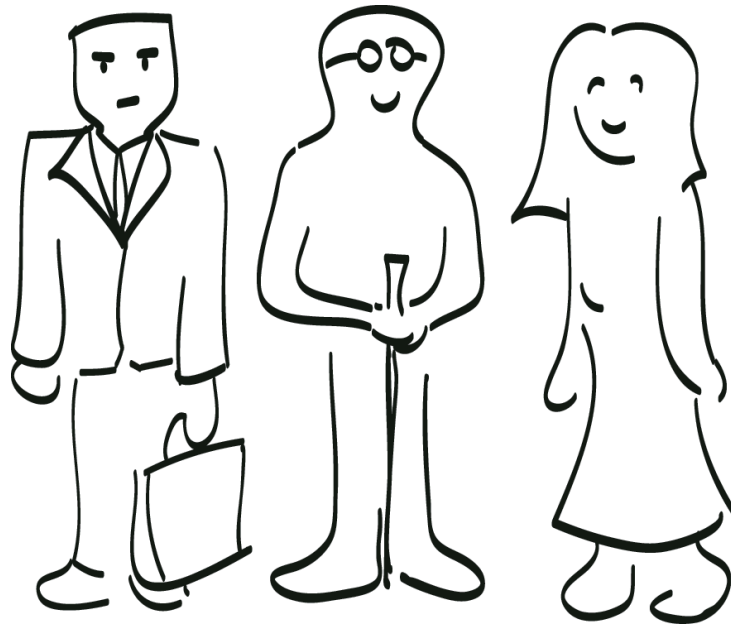
Domain

Design

Tasks

Scenario

Discussion



“Hmm... better without sound. Lets read it”

Beant Dhillon | Ioannis Politis | Jorge Peregrín Emparanza
Multimodal Interaction | USI program 2009 | TU/e

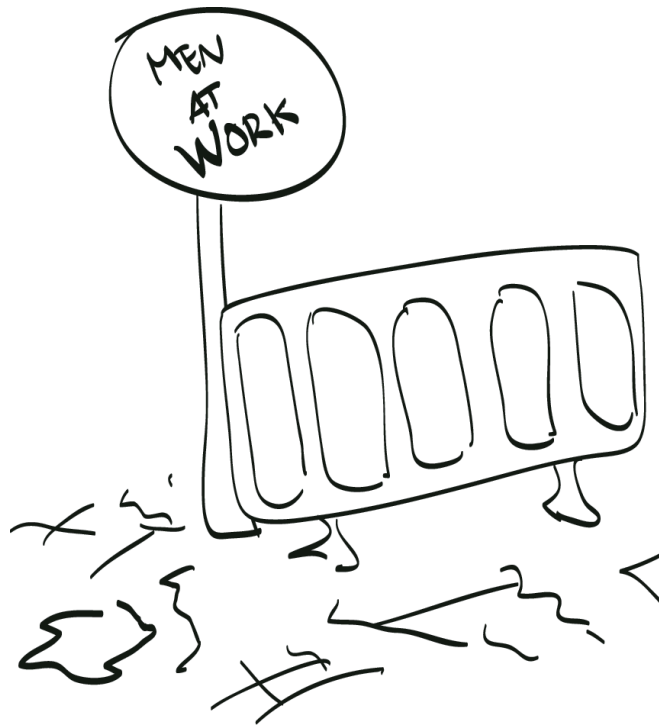
Domain

Design

Tasks

Scenario

Discussion



“Caution! Irregular floor due to works”

Beant Dhillon | Ioannis Politis | Jorge Peregrín Empananza
Multimodal Interaction | USI program 2009 | TU/e

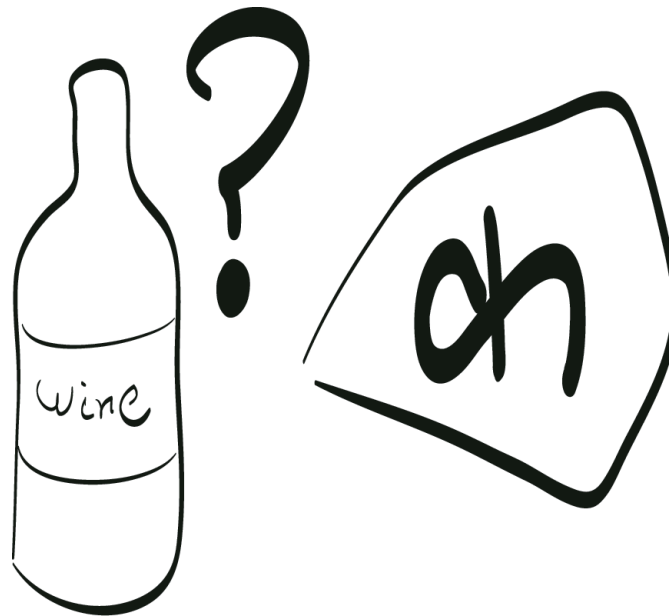
Domain

Design

Tasks

Scenario

Discussion



Have a sudden request? Search for it

Beant Dhillon | Ioannis Politis | Jorge Peregrín Emparanza
Multimodal Interaction | USI program 2009 | TU/e

Domain

Design

Tasks

Scenario

Discussion



Want to place a land-mark?

Beant Dhillon | Ioannis Politis | Jorge Peregrín Emparanza
Multimodal Interaction | USI program 2009 | TU/e

POSSIBILITIES

Domain

Exploratory Navigation

e.g. a map overview with sounds, comments

Design

On-the-fly navigation

Tasks

Using 3-D gestures

e.g. Alternative routes :

Scenario

Hold Menu button, Shake stick twice

Discussion

Add-on hand held device

Screen affords Using tactile input : Braille system

more elaborate interactions

simplifying the stick further



Domain

DESIGN QUESTIONS

Design

Simple vs Fun

Tasks

Output Redundancy vs Useless repetition

Only 22% of university students read braille

Scenario

Eliminate Screen?

Discussion

Optimal number of choices

Audio/Haptic/Gestural



THE
STICK

Beant Dhillon | Ioannis Politis | Jorge Peregrín Emparanza

THE **STICK**

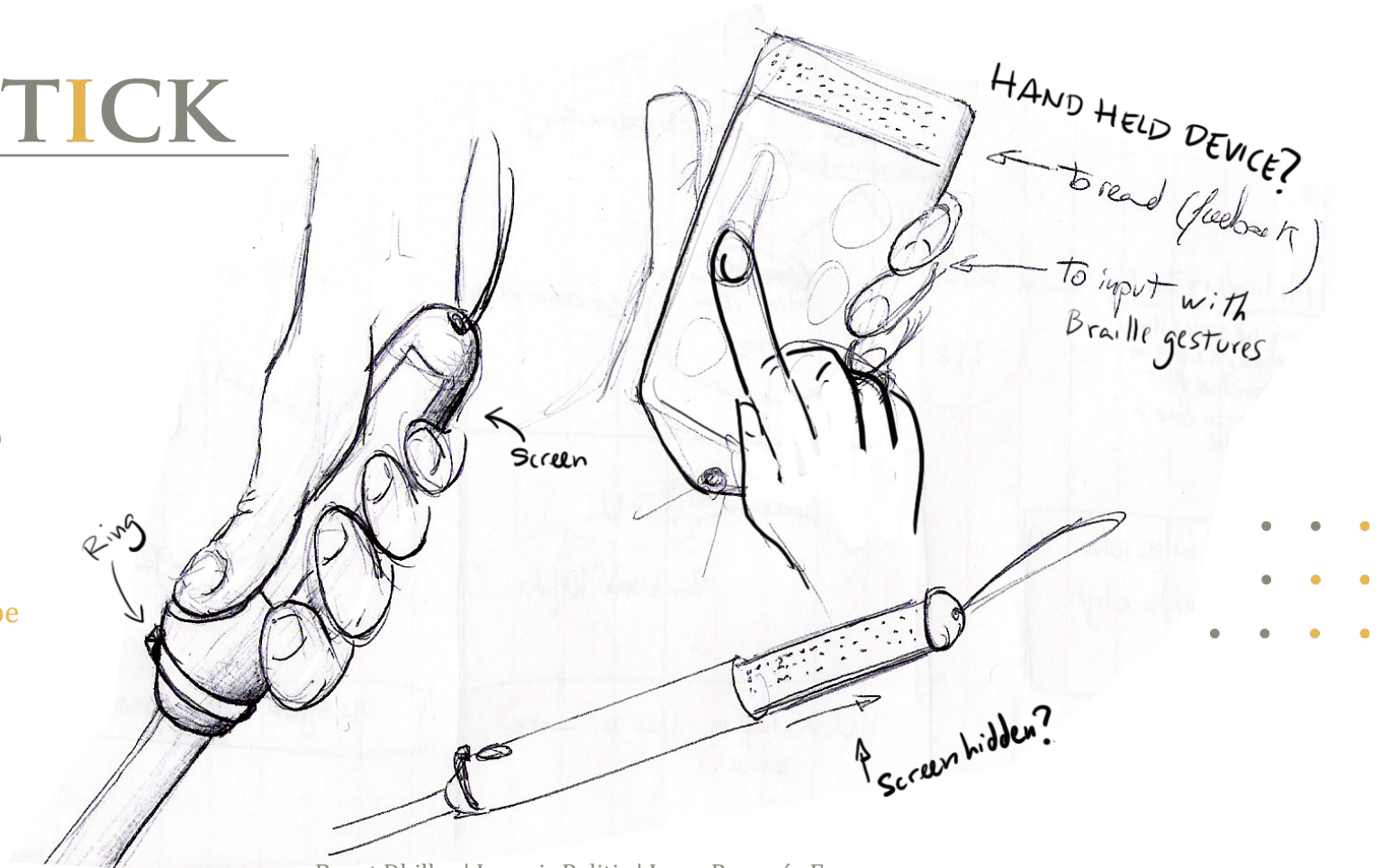
Domain

Design

Scenario

Tasks

Prototype



Beant Dhillon | Ioannis Politis | Jorge Peregrín Empananza
Multimodal Interaction | USI program 2009 | TU/e

THE **STICK**

Domain

Design

Tasks

Scenario

Discussion



Wireless communication with laptop

Beant Dhillon | Ioannis Politis | Jorge Peregrín Emparanza
Multimodal Interaction | USI program 2009 | TU/e