

DEMOCRATIZING DATA-DRIVEN HEALTHCARE

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techandpeople.github.io

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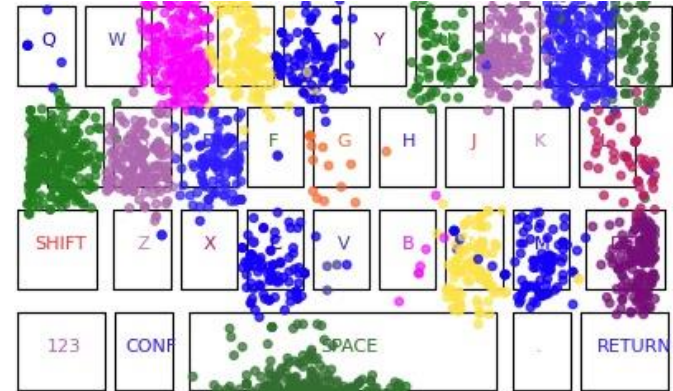
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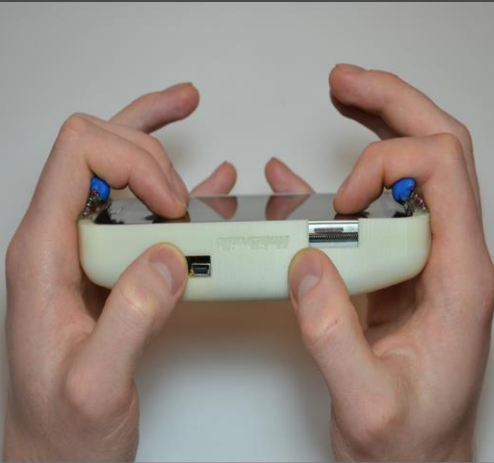
MOTTO

#Tech&People Lab

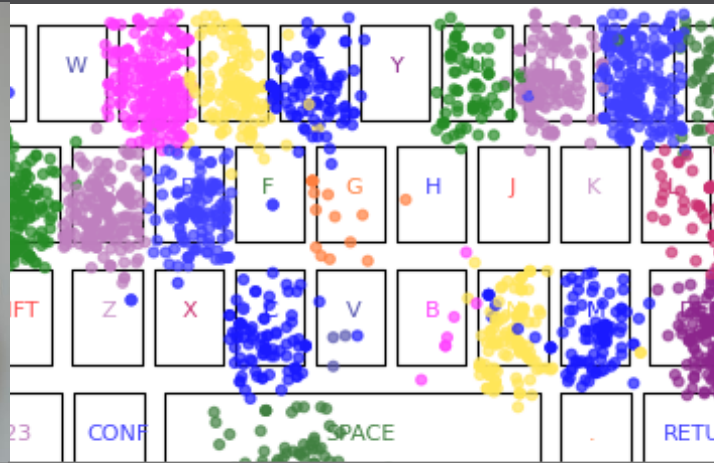
We design, build, and evaluate interactive technologies that address high value social issues such as accessible computing and pervasive healthcare.



EXAMPLE PROJECTS



Braille I/O



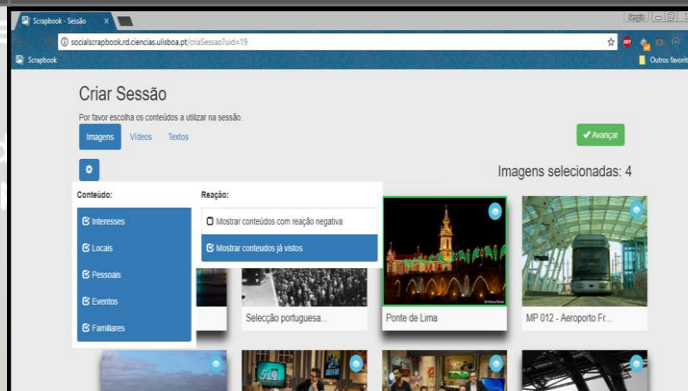
Touch modelling



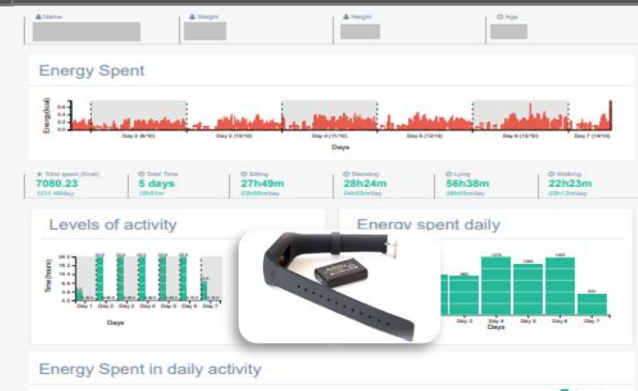
Blind People & Robots



Robots to Support
People with Dementia



Novel approaches for Dementia
Care & Intervention



Data-Driven Healthcare for
Parkinson's Disease

SOCIAL DRIVE

Impacting people's lives

We have prototypes being used by blind people for more than 12 years.

We have prototypes being used by people with Dementia and Parkinson, their clinicians and families.

A large share of our research is done in the wild

USER-DRIVEN



BUILD AND EVALUATE




STORIES OF ACCESS

ACCESS FOR PEOPLE WITH TETRAPLEGIA



ACCESS FOR PEOPLE WITH TETRAPLEGIA

A woman with tetraplegia is seated in a specialized wheelchair, using a head-mounted device to interact with a computer. The device consists of a black headband with a small screen and a microphone. She is looking at a large computer monitor displaying a website. The background is a plain white wall.

I saw something on the news about a new technology for people with tetraplegia. It seems that that problem is solved!


DEALING WITH THE REAL WORLD



THE FIRST PLUX DEVICE



MOBILE ACCESSIBILITY FOR BLIND PEOPLE



The iPhone has a screen reader now. It seems that that problem is solved!



OTHER COMMON EXAMPLES

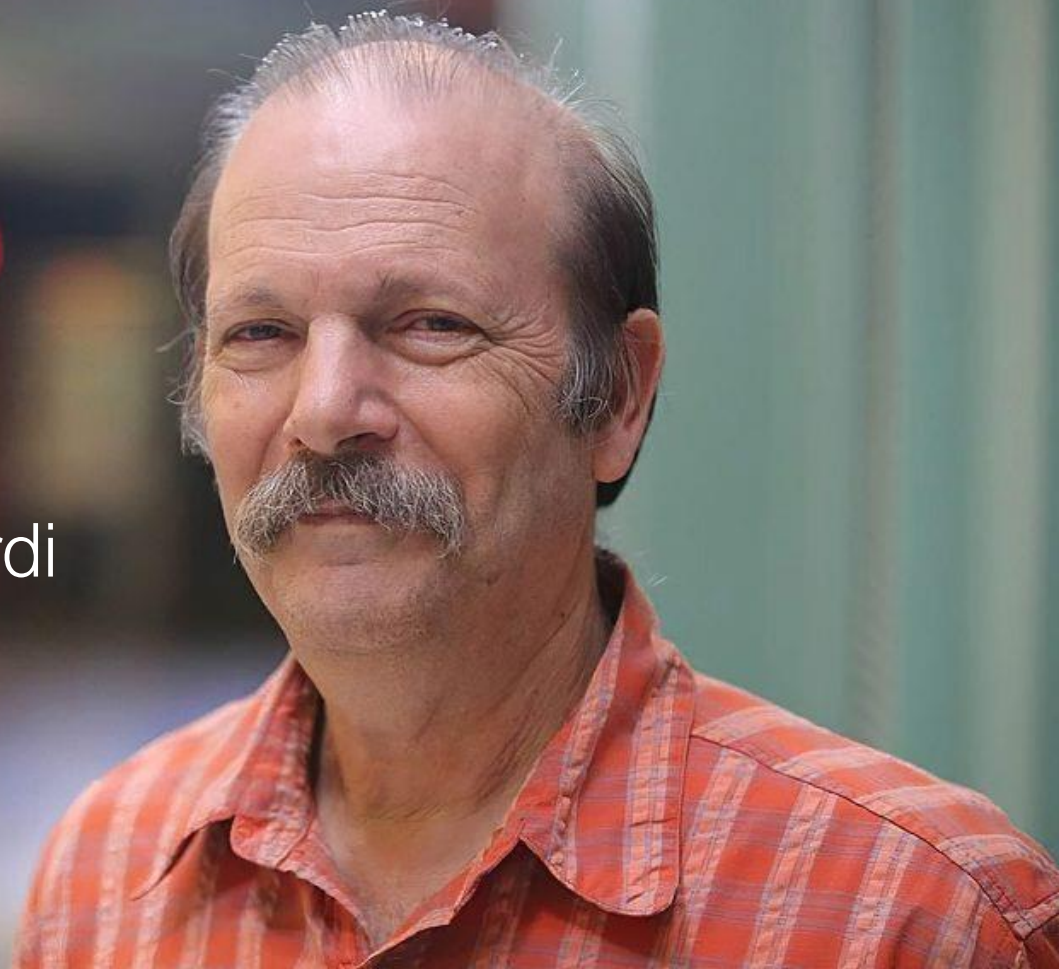


STEREOTYPES

Monolythic and superficial perspectives on
complex ecosystems and people

TECHNOLOGY IS DRIVING THE FUTURE

“...but who is doing the steering?”
-Moshe Vardi



ARE WE REALLY SOLVING PEOPLE'S PROBLEMS?



#1

Make sure your path has a
promisingly useful destination

USER-CENTERED DESIGN IS DEPRECATED

COMMON BUT SUPERFICIAL?



USER-CENTRED DESIGN **TODAY**

Highly **transactional** process

Excuse for justifying stereotypes

Users are craving for technologies that target their needs, even if they are not good enough

[Trewin et al., Usage of Subjective Scales in Accessibility Research, 2015]

Divergent mental models and slow advances



TAKE IT UP A NOTCH

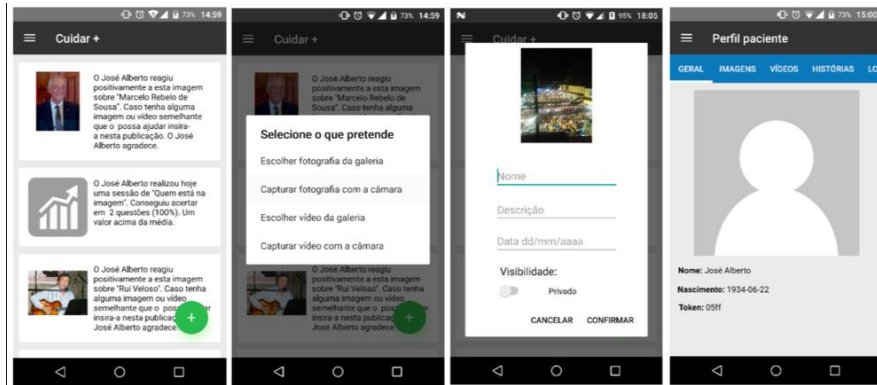
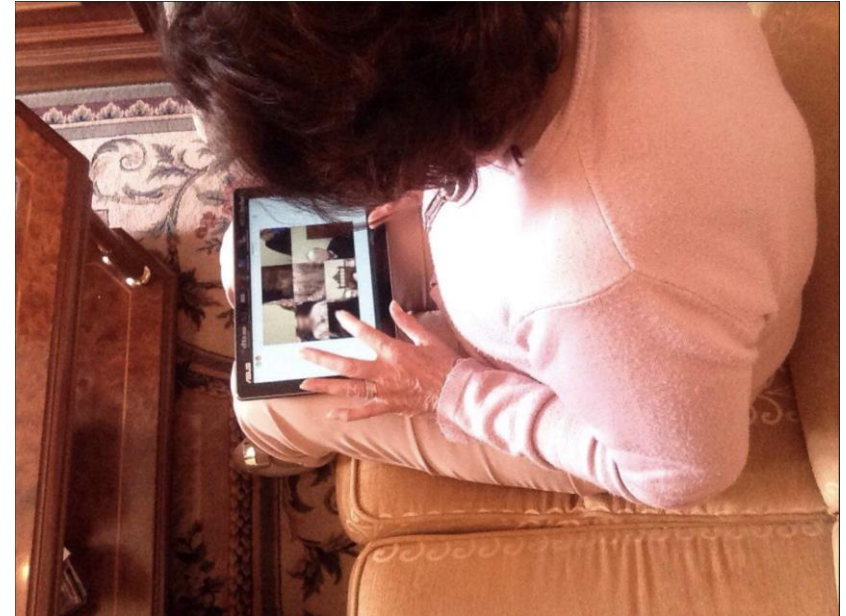
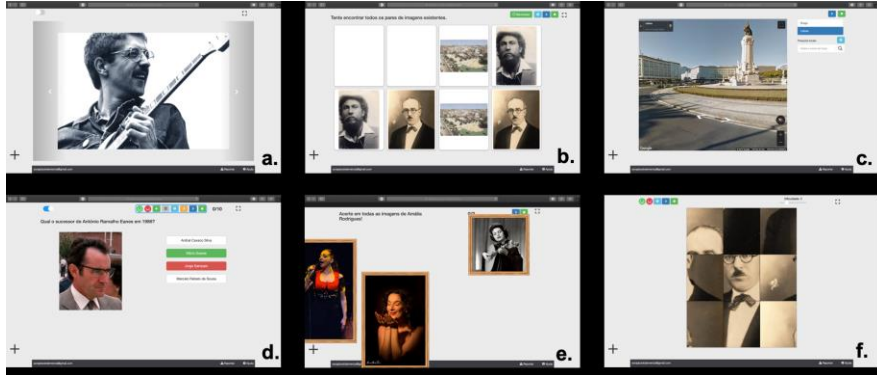
Embed yourself in the context you are working at

If we are researching and building technology for users....

....need to be experts on the **technology**, and the **users** and their **context**.

How are we doing that?

SCRAPBOOKS



Sérgio Alves, Filipa Brito, Andreia Cordeiro, Luís Carriço, and Tiago Guerreiro. 2019. Designing Personalized Therapy Tools for People with Dementia. In W4A '19.

DATAPARK



Diogo Branco, Raquel Bouça, Joaquim Ferreira, and Tiago Guerreiro. 2019. Designing Free-Living Reports for Parkinson's Disease. In CHI EA '19.

#2

Embed yourself and be an expert
on your target domain

DEMOCRATIZING DIGITAL HEALTHCARE

GATEKEEPING

When you ask your grandma
what's her recipe and she act
like she didn't hear you.



All right, then. Keep your secrets.

NOT ONLY ABOUT CHEAPER DEVICES

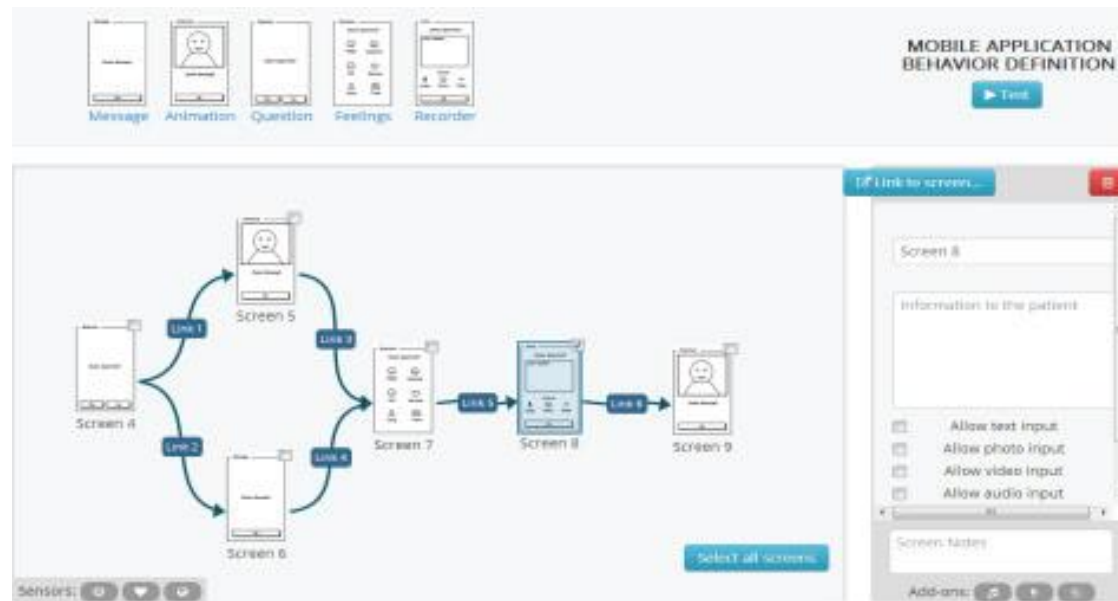


Democratize: make (something) accessible to everyone

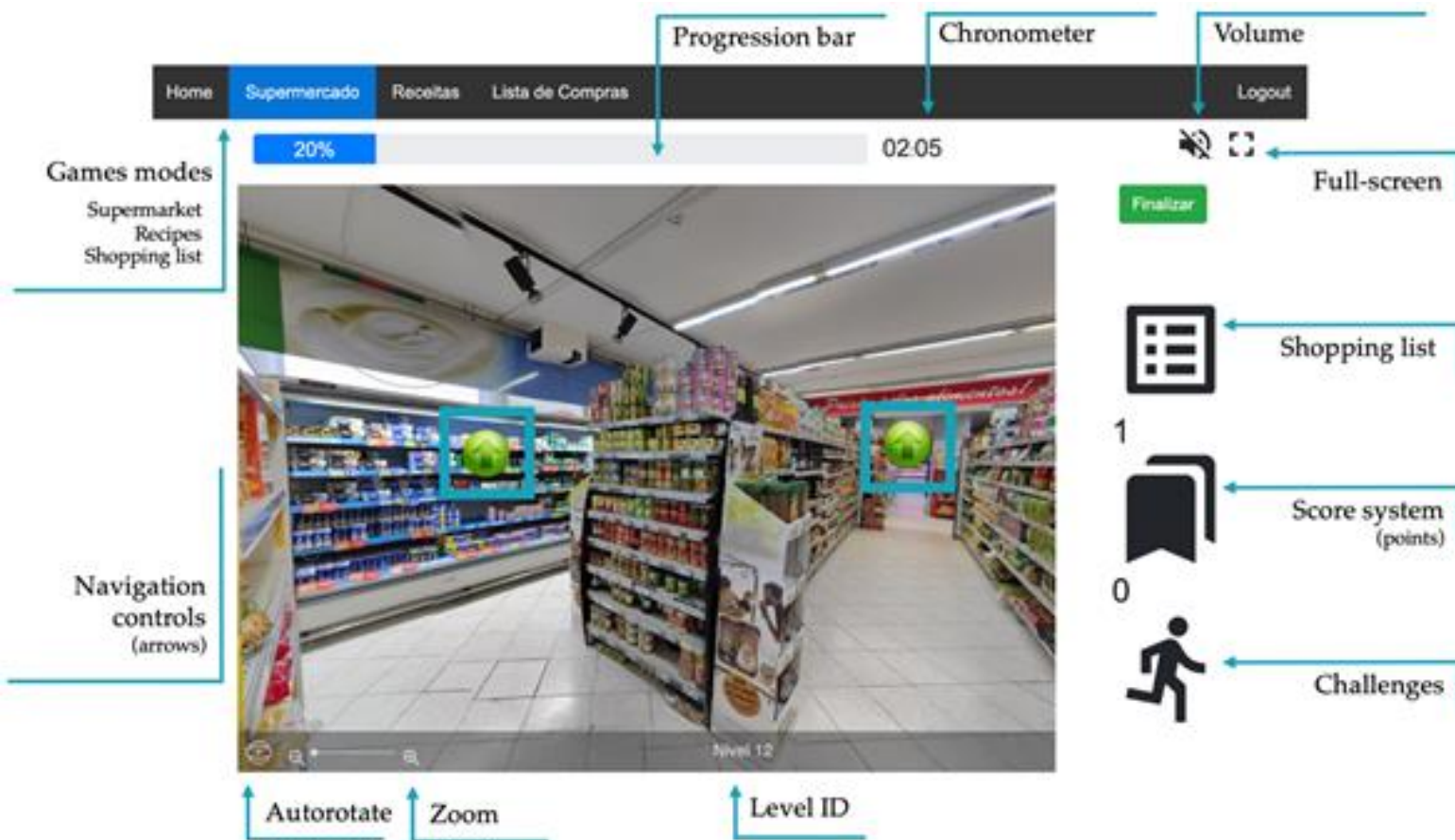
EARLY ACCESS AND PERSONALIZATION

Enable experimentation and discussion

Enable personalization

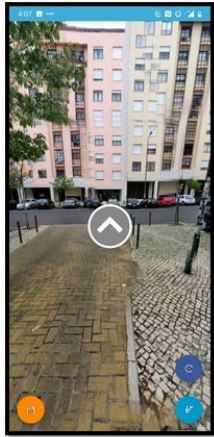


NEUROVREHAB



Ferreira-Brito F, Alves S, Santos O, Guerreiro T, Caneiras C, Carriço L, Verdelho A. Photo-Realistic Interactive Virtual Environments for Neurorehabilitation in Mild Cognitive Impairment (NeuroVRehab.PT): A Participatory Design and Proof-of-Concept Study. *J Clin Med.* 2020

END-USER AUTHORIZING OF VR FOR THERAPY



a)



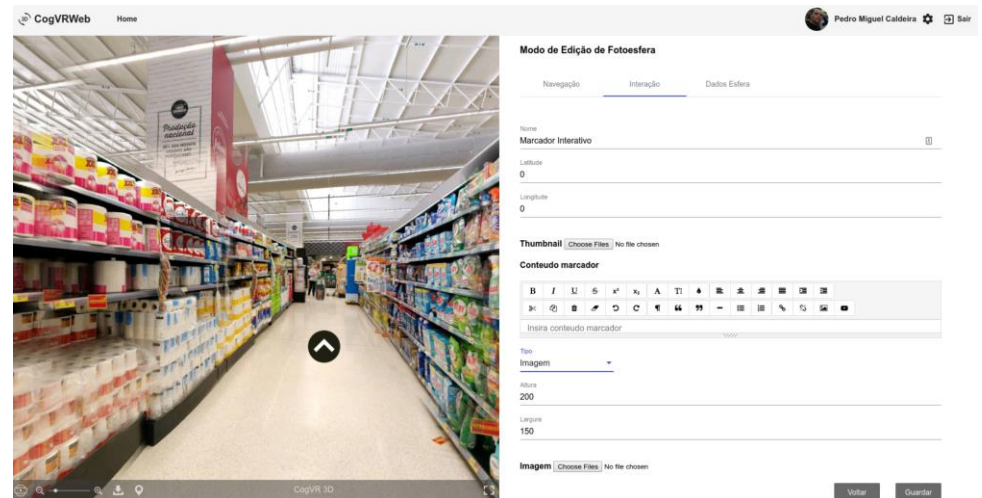
b)



c)



d)




#3

Democratize technology
and enable your users

MAKING HEALTHCARE TECHNOLOGIES MAINSTREAM

OPENMOVEMENT

[←](#) [→](#) [↻](#) [🏠](#) [https://github.com/digitalinteraction/openmovement](#) [★](#) [P](#) [G](#) [💬](#) [📄](#) [⚙️](#) [👤](#) [⋮](#)


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[🔗 master](#) [🔗 2 branches](#) [🏷 12 tags](#) [Go to file](#) [Add file](#) [📄 Code](#)

	danielgjackson Merge branch 'master' of github.com:digitalinteraction/openmovement 41b0995 9 days ago 🕒 720 commits
📁 Docs	Update ax3-faq.md last month
📁 Downloads	Update AX3-Firmware.md 5 months ago
📁 Firmware	Unsupported 2 years ago
📁 Hardware	PCB and schematics. 2 years ago
📁 Mechanical	Consistent link format. 6 months ago
📁 Software	Merge branch 'master' of github.com:digitalinteraction/openmovement 9 days ago
📄 .gitignore	OMGUI V43 2 years ago
📄 README.md	Update README.md 10 months ago

About

Open Movement devices are miniature, embeddable, open source sensors developed at Newcastle University, UK. The source code for the firmware and software is available under a BSD 2-clause license, and the hardware (PCB designs, layouts and schematics), enclosure designs and documentation are available under a Creative Commons 3.0 BY Attribution

...

[📖 Readme](#)

[Releases](#) [12](#)

Collaboration with Newcastle (OpenLab),
Northumbria (NorthSC), and Parkinson's UK

- 3-axis accelerometer (up to 200Hz)
- BLE 4.0 Communication
- Vibrotactile feedback
- 2 controllable LEDs
- 30+ days of battery duration
- Support over-the-air firmware updates
- Costs ~20€



DESIGNING WITH PEOPLE WITH PD

Parkinson's Drool Cueing

Personalized cues for swallowing

No need for constant interaction with the phone

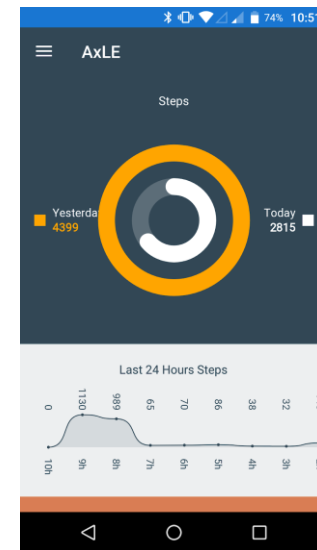
Medication reminders

Activity tracker

People in control

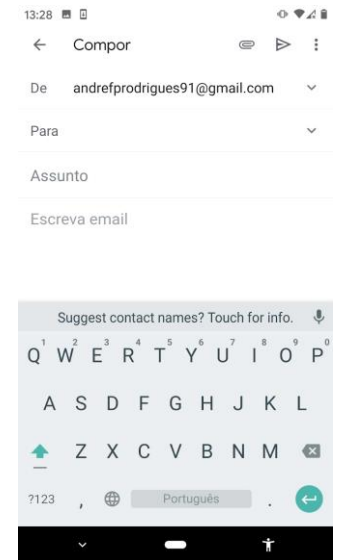
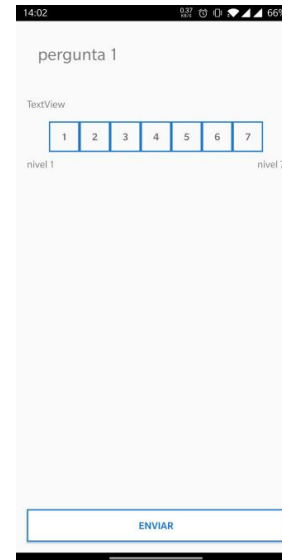
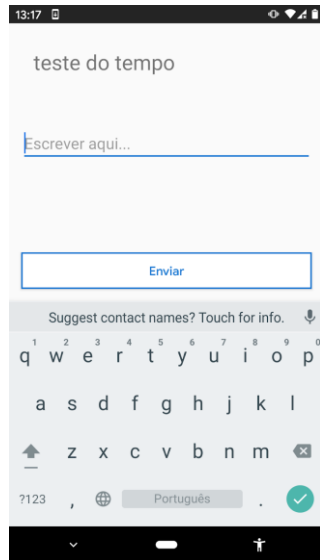
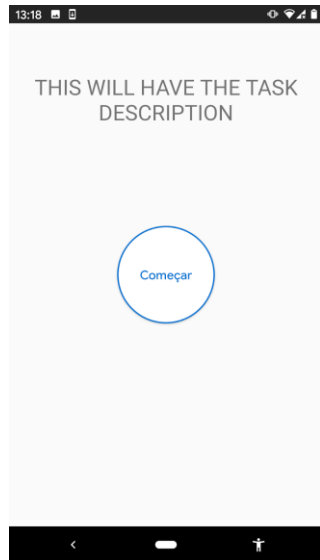
Share personal data with other people or existing health-care systems

Enroll in research studies



TEXT-ENTRY AS A DIGITAL ENDPOINT

Writing on smartphones is now pervasive to our lives
Lab and in the wild (controlled and uncontrolled)
collection of data
Privacy by design



CURRENT CHALLENGES

What's the best way to collect this data?

The most information with the least effort

How to deliver these outputs to clinicians....and to users themselves?

#4

Make it simple, usable, and
useful

WHO'S STEERING THE WHEEL?

MAIN TAKEAWAYS

Make sure your travel has a promisingly useful destination

Embed yourself and be an expert on your target domain

Democratize: enable personalization and share early

Make it simple, usable, and useful



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