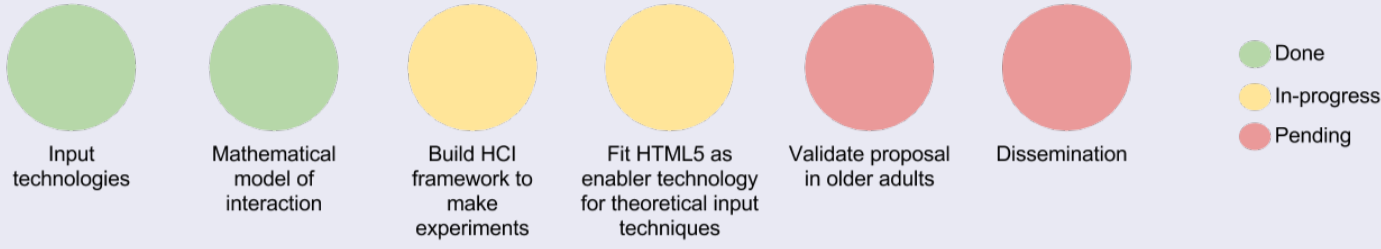


# Human Computer Interaction for Older Adults

Graphical user interfaces and the peripherals to use them has evolved a lot from the early times. The spectrum of users is also wider now. Technology is everywhere and every time, but at every age? How do older adults interact with technology? World population is getting old, so these questions are gaining importance

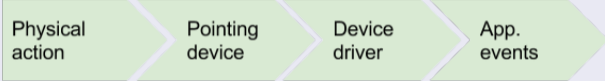
## Goals and Research Plan



- Improve graphical user interfaces for older adults
- Model interaction mathematically to measure the performance of different interfaces and input techniques
- Take advantage of HTML5 and new interaction techniques only feasible in lab environments so far

## Input Device Events

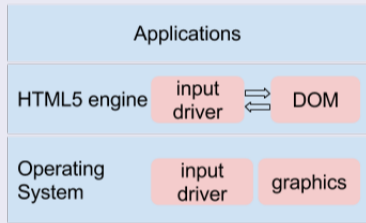
Traditionally, events from input devices went from the low level layers of the operating system to the top application with minor modifications, just some acceleration adjustments.



The proposal to explore in this work introduces a new layer between the operating system and the application, using the browser engine as an enabler technology.

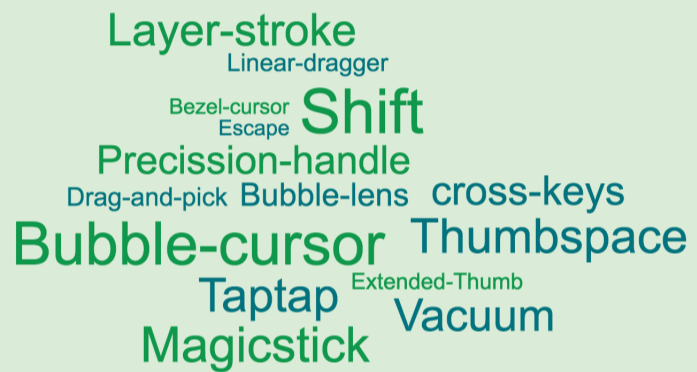


The key point of this approach is the ability to use the information about the representation of the application to improve the algorithms that translate the physical action into and application action, that is, the input technique.



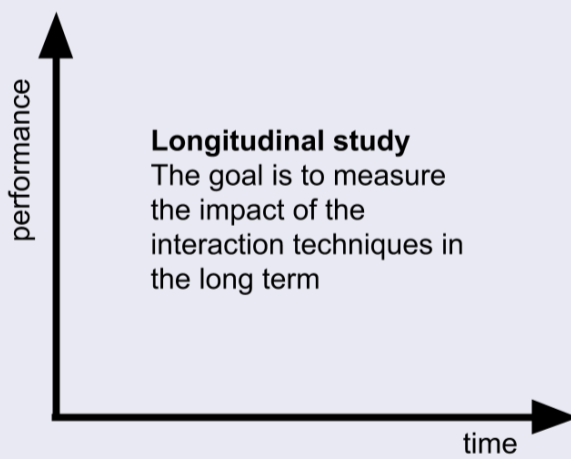
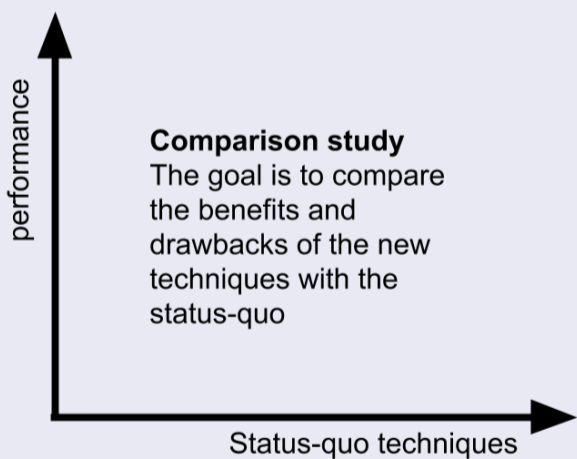
## Target Aware Techniques

Target aware input techniques use the information from the environment [Lai2014, Wu2015] to transform the input action into an application layer action. These techniques can, for example, use semantic information of the elements on the interface; or learn about past usage of the application by a given user. They have not been used in real environment due technology limitations, but the growth of HTML5 usage for any type of user interface in any device open a interesting door to adopt these techniques widely.



The main drawback of these techniques: they were not intended for older adults, so miss some considerations about the abilities of this group of people. During this work, we will validate them with these users to propose improvements to fit better the requirements for these user. HTML5 will play a key role because of ability to introspect the graphical elements and add semantic information to them.

## Validation Plan



### W3C ARIA

Very active workgroup  
Proposals should not be just for ad-hoc scenarios, but they should be considered powerful enough to be included in the standard. To reach this goal, we will make contributions to the open platforms to get industry feedback.



## Results

The main results of this year can be summarized in:

- Deep understanding of context-aware techniques, and their role to improve the performance and easiness of current user interfaces for new devices and users with different capabilities.
- Start working on contributions to improve some state-of-the-art context-aware techniques
- First contacts with the W3C HTML5 ARIA specification

## Research Directions

- Improve accuracy of metrics
- Measurements in existing interfaces
- Propose new interfaces to optimize the easiness/performance tradeoff for older adults
- Validate these new interfaces with the metrics
- Dissemination in conferences and journals

## References

[Lai2014] Jianwei Lai and Dongsong Zhang. Extendedthumb: A motion-based virtual thumb for improving one-handed target acquisition on touch-screen mobile devices. In Proceedings of the Extended Abstracts of the 32Nd Annual ACM Conference on Human Factors in Computing Systems, CHI EA 14, pages 1825:1830, New York, NY, USA, 2014. ACM

[Wu2015] Siju Wu, Amine Chellali, Samir Otmane, and Guillaume Moreau. Layerstroke: A layer based selector for small target acquisition. In Proceedings of the 27th Conference on LInteraction Homme-Machine, IHM 15, pages 38:138:6, New York, NY, USA, 2015. ACM.