A SYSTEM THAT SEES YOUR NEEDS

BRAUDE
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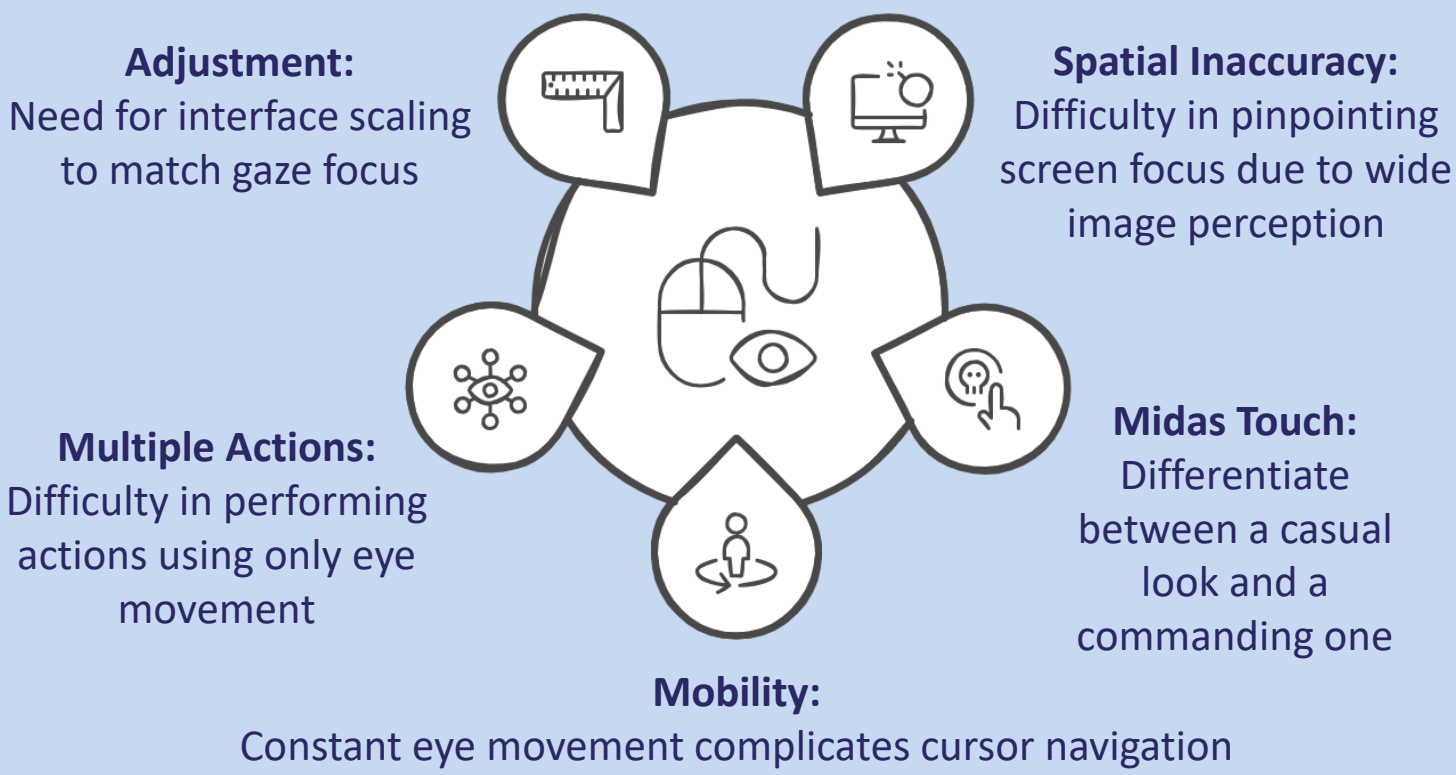*Braude College of Engineering Karmiel, Israel, julia@braude.ac.il

INTRODUCTION

Technology significantly impacts daily life, especially for individuals with disabilities. For example, those with Amyotrophic Lateral Sclerosis (ALS) use eye-tracking technology to control computers with eye movements, bypassing the need for traditional inputs. However, ALS patients still face challenges with certain tasks. Our study focuses on one individual who uses eye-tracking to navigate Adobe Premiere's video editing software. We aim to simplify their experience by enhancing access to existing shortcut commands and creating a tailored interface. This research underscores the potential for personalized assistive technology, opening more opportunities for individuals with disabilities.

METHOD

1 EMPATHY

- To improve our understanding of the development field, we met with Tom (pseudonym), an individual living with ALS, confined to a wheelchair and cannot move his limbs.
- We observed him using Adobe Premiere Pro for video editing and conducted informal interviews with him and his caregiver.
- Tom operates the PCEye from Tobii, which features TD Control software, allowing him to navigate the interface with eye movements.
- The eye-tracking method poses challenges for dragging actions, usually executed with a mouse, making video editing tasks less precise.

Figure 1: Challenges in the interaction between the patient, the eye-tracking system, and the computer.

Adjustment: Need for interface scaling to match gaze focus

Spatial Inaccuracy: Difficulty in pinpointing screen focus due to wide image perception

Multiple Actions: Difficulty in performing actions using only eye movement

Midas Touch: Differentiate between a casual look and a commanding one

Mobility: Constant eye movement complicates cursor navigation

2 DEFINE & IDEATE

- Used co-design methodology with Tom as an active co-designer.
- Rather than directly improving the drag action, we aimed to enhance its mechanics by creating corresponding buttons for keyboard shortcuts in Adobe Premiere Pro.

3 PROTOTYPING

- We proposed a customized side panel to help Tom work more efficiently.
- Concluded that a larger panel would be most effective.
- Simplified the design by removing button images and minimizing colors and text.
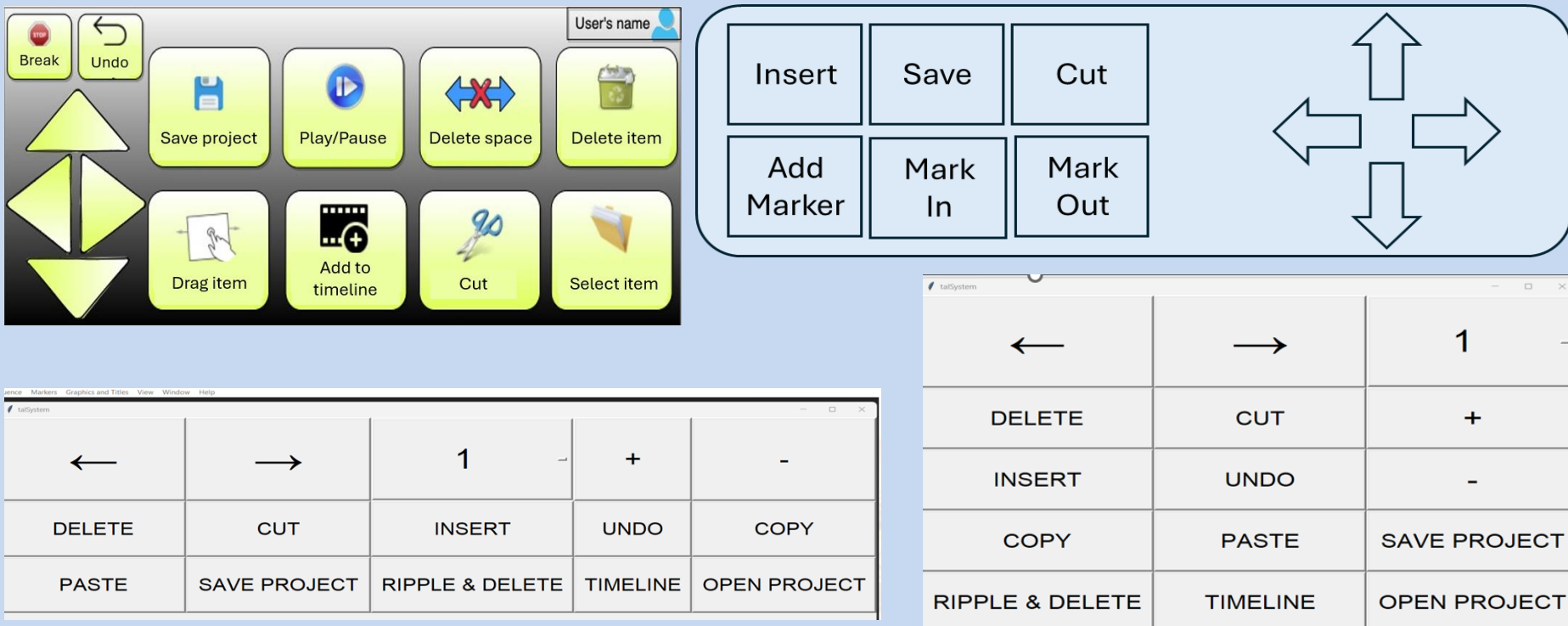

Figure 2: The panels created for the client to evaluate from the initial panel (top-left) to the final panel (bottom-right).

4 EVALUATING

Tom mentioned, *"This is a breakthrough for me. Using the panel has significantly improved my work."*
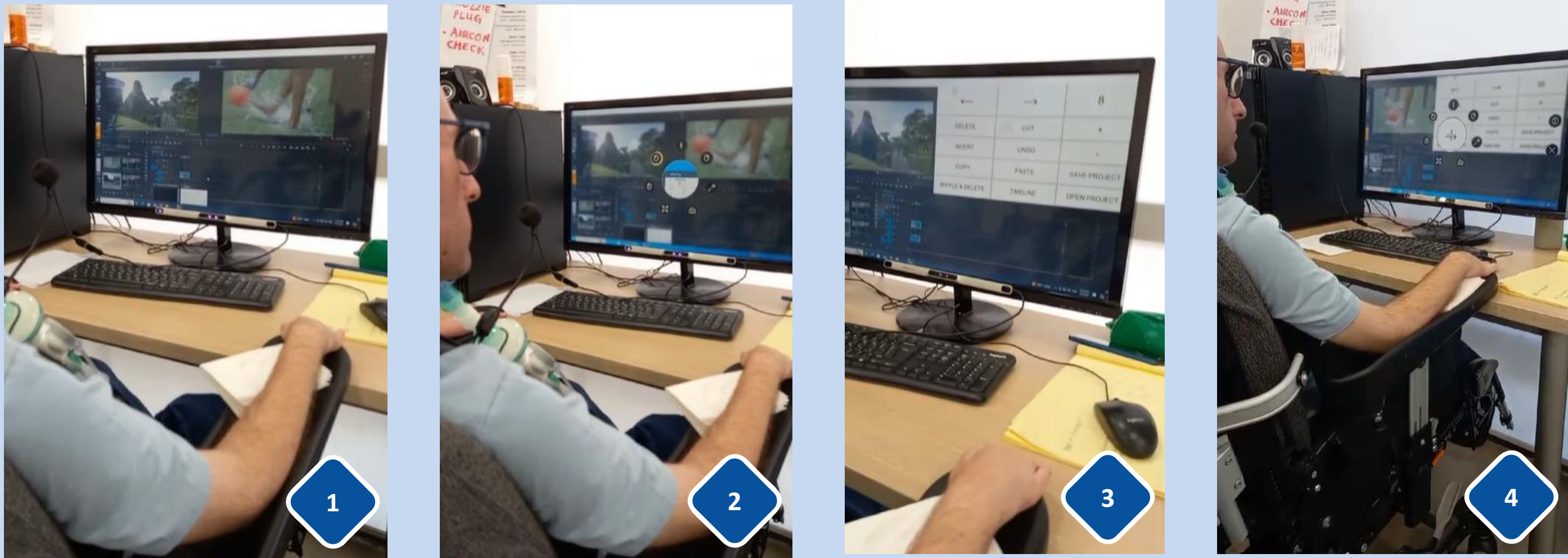

Figure 3: The individual using the final prototype.

Using the panel:
1. Tom sits in front of the computer and performs the following steps: (1) activates the executable file of our system to open it and (2) opens the Adobe Premiere Pro video editing tool.
2. The PCEye device recognizes Tom's gaze and displays the TD Control panel. Tom uses this software for basic functionalities, such as "double-click."
3. The panel occasionally appears "floating." If Tom wants to use it, he looks at it.
4. Our system, in conjunction with the TD Control software, detects Tom's gaze and activates the relevant functionality he focuses on.

FUTURE WORK

In our future work, we plan to implement a customized solution for individuals with ALS using software other than Adobe Premiere. Our goal is to tailor the interface to meet the specific needs of ALS patients through eye-tracking technology, incorporating selected features and designing buttons accordingly.

We also aim to adapt this interface for individuals with other disabilities using eye-tracking across various software platforms to enhance their experience and promote independence. **Ultimately, we strive to develop an intelligent system that identifies user needs based on disability type and preferred software, adjusting the interface to suit them.**