**Comparing Layouts for Eye Gaze-based PIN entry for people with Upper Extremity Impairment**

**Purpose of the research study:**

PINs are common security measures for aspects like bank accounts and device login. However, so far little work has been done to explore what PIN entry layouts are usable for people using eye gaze trackers. Our goal in this study is to compare three different PIN entry layouts to compare which ones work most effectively for eye gaze tracker users.

**What will happen during the study:**

In this study each participant will be asked to try each of three different layouts: a typical 3x3 PIN layout, a 5x2 horizontal layout, and a rotary layout. For each layout, the participants will input 15 randomly generated 6 digit PINs.

**Evaluation:**

* Each participant will be randomly assigned one of the three PIN layouts
* The participant will be given a short period of time to familiarize themselves with the PIN layout.
* For each of 15 PINs
  + The participant will be shown the PIN on screen and given 30 seconds to memorize the PIN
  + The participant will be asked to enter the PIN
  + They will be given three tries if a mistake in entry is made to enter the PIN
* The participant will repeat this process with all of the PIN layouts

All of the PINs will be randomly generated. At no point will any of the participants be asked to enter sensitive information or PINs that they use. Any data collected during the familiarization phase will be discarded.

**Debrief**

At the end of the evaluation phase we will ask the participants a few questions on which PIN entry system they liked and why. The participants will also be asked a few demographic questions including age, gender, disability, and frequency of eye gaze tracker use.

**Participant Recruitment**

We will recruit participants who have a form of upper extremity impairment (UEI) and are regular users of eye gaze trackers as an assistive device for computing use or communication. A person with UEI is anyone without full use or range of motion of their arms, shoulders, or hands.

**Recordings during the study:**

Video recordings will be made of the evaluation phase only. The debriefing session will be audio recorded.

**Compensation:**

$10 gift card

**Time required:**

Approximately 45-60 minutes.

**Risks:**

There are no anticipated risks to the participants.

**Benefits:**

There are no direct benefits to the participants for participating in this research study. The overall benefit of this study will be better understanding of how to design usable PIN interfaces in the future.

**Confidentiality:**

The information provided will be treated as confidentially as possible. The participant’s name will not be used in any report or communication. Confidentiality will be protected by not collecting any identifying information when possible. If any identifying information is collected, it will be deleted after data analysis.

Video recordings will be made of the evaluation phase only. The debriefing session will be audio recorded. The video recordings will be deleted after a security study is completed. The audio recordings will be deleted after their content is transcribed and verified to be accurate.

**Voluntary participation:**

Participation in this study is completely voluntary.

**How to withdraw:**

Participants have the right to withdraw from the study or an individual session at any time without consequence. To withdraw, all they have to do is to inform the researchers. Moreover, participants who withdraw will still receive $10 compensation.