

Krishna Venkatasubramanian  
Computer Science and Statistics  
Comparing Layouts for Eye Gaze based PIN Entry  
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## STUDY TITLE

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

## PRINCIPAL INVESTIGATORS

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## KEY INFORMATION

Important information to know about this research study:

- The purpose of the study is to learn about which PIN entry layouts work well for eye gaze entry.
- If you choose to participate, you will be asked to enter automatically generated six-digit PINs in three different PIN layouts. This will take approximately one hour.
- Risks or discomforts from this research are expected to be minimal
- The study will have no direct benefits to you
- You will be paid \$10 as a gift card for your participation
- You will be provided a copy of this consent form.
- Taking part in this research project is voluntary. You don't have to participate, and you can stop it any time.

## INVITATION

You are invited to take part in this research study. The information in this form is meant to help you decide whether or not to participate. If you have any questions, please ask.

## Why are you being asked to be in this research study?

You are being asked to be in this study because you are a person with an upper extremity impairment (UEI) who regularly uses an eye gaze tracker. A person with UEI is anyone without full use or range of motion of their arms, shoulders, or hands.

## What is the reason for doing this research study?

PIN entry has historically been designed for touch-based interfaces. By looking specifically at ease of entry for eye gaze trackers we hope to build a better understanding of how to best build layouts for PIN entry for eye gaze trackers.

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### **What will be done during this research study?**

During the study you will be provided with a 6 digit PIN that you will be given time to memorize. You will then be asked to enter the PIN on one of three different interfaces which will be selected at random. You will be asked to enter 15 PINs for each of three entry layouts. A video recording will be made of you entering PINs and metrics from the eye gaze tracker will be logged such as gaze points, gaze duration, and errors made.

Afterward, you will be asked a few questions about your opinions on the interfaces as well as a few demographics questions such as age, gender, and disability.

### **How will my video and audio recordings be used?**

Your video recordings will be used as part of a security evaluation for the PIN entry in which study participants will be able to view the PIN entry and attempt to copy the PIN that you have entered during the study. This will allow us to evaluate whether or not the PIN entry is robust to shoulder surfing attacks. Your demographic information will not be included in these recordings. Facial features such as your eyes may be necessary to test the fidelity of the system to shoulder surfing attacks from various angles, and therefore will not be blurred in the recording. You can still participate if you do not want your video recordings to be part of the security evaluation.

At the conclusion of the study we will ask you questions about your experience. Those answers will be audio recorded. The audio recordings will then be transcribed, and the audio will be deleted after the transcription is made and verified to be accurate. You can still participate if you do not want to be recorded.

### **What are the possible risks of being in this research study?**

There are no known risks to you from being in this research study.

### **What are the possible benefits to you?**

You are not expected to get any benefit from being in this study.

### **What are the possible benefits to other people?**

We hope that this work will results in better understanding of how to design PIN entry methods for eye gaze tracker users.

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**What will being in this research study cost you?**

There is no cost to you to be in this research study.

**Will you be compensated for being in this research study?**

You will receive a \$10 gift card for participating in this study

**What should you do if you have a problem during this research study?**

Your welfare is the major concern of every member of the research team. If you have a problem as a direct result of being in this study, you should immediately contact one of the people listed at the beginning of this consent form.

**How will information about you be protected?**

Reasonable steps will be taken to protect your privacy and the confidentiality of your study data.

The data will be stored electronically through a secure server and will only be seen by the research team during the study and for 5 years or longer after the study is complete.

The only persons who will have access to your research records are the study personnel, the Institutional Review Board (IRB), and any other person, agency, or sponsor as required by law. The information from this study may be published in scientific journals or presented at scientific meetings but the data will be reported as group or summarized data and your identity will be kept strictly confidential.

**What are your rights as a research subject?**

You may ask any questions concerning this research and have those questions answered before agreeing to participate in or during the study.

For study related questions, please contact the investigator(s) listed at the beginning of this form.

For questions concerning your rights or complaints about the research contact the Institutional Review Board (IRB) or Vice President for Research and Economic Development:

- IRB: (401) 874-4328 / [researchintegrity@etal.uri.edu](mailto:researchintegrity@etal.uri.edu).
- Vice President for Research and Economic Development: at (401) 874-4576

**What will happen if you decide not to be in this research study or decide to stop participating once you start?**

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You can decide not to be in this research study, or you can stop being in this research study ("withdraw") at any time before, during, or after the research begins for any reason. Deciding not to be in this research study or deciding to withdraw will not affect your relationship with the investigator or with the University of Rhode Island (list others as applicable).

You will not lose any benefits to which you are entitled.

### Documentation of informed consent

You are voluntarily making a decision whether or not to be in this research study. Signing this form means that (1) you have read and understood this consent form, (2) you have had the consent form explained to you, (3) you have had your questions answered and (4) you have decided to be in the research study. You will be given a copy of this consent form to keep.

### Participant Name:

\_\_\_\_\_  
(Name of Participant: Please print)

### Participant Signature:

\_\_\_\_\_  
Signature of Research Participant

\_\_\_\_\_  
Date

### Investigator certification:

My signature certifies that all elements of informed consent described on this consent form have been explained fully to the subject. In my judgment, the participant possesses the capacity to give informed consent to participate in this research and is voluntarily and knowingly giving informed consent to participate.

\_\_\_\_\_  
Signature of Person Obtaining Consent

\_\_\_\_\_  
Date

### AUDIO/VIDEO ADDENDUM TO THE CONSENT FORM FOR RESEARCH

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**As part of this study we would like to record video. This video will be used in order to study the security of our systems against shoulder surfing attacks. For this study, participants will be shown your video recordings and will attempt to enter the same PIN using the recordings.**

**As part of this study we would also like to record audio. This audio will be used to transcribe your responses and then will be deleted.**

By signing this consent form, I confirm that I give my permission for video and audio recording(s) of me, to be used for the purposes listed above, and to be retained *for 5 years or longer*. You may still participate in this study if you are not willing to be recorded.

\_\_\_\_\_  
Printed Name of Participant

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed Name of Person Obtaining Consent

\_\_\_\_\_  
Signature of Person Obtaining Consent

\_\_\_\_\_  
Date