

## Appendix A: Application for Approval for Use of Human Participants in Research

Before completing this application, please read the *Policies and Procedures for Human Research Protections* to understand the responsibilities for which you are accountable as an investigator in conducting research with human participants. The document, *Application Instructions*, provides additional assistance in preparing this submission. ***Incomplete applications will be returned to the investigator. You may complete this application online and save it as a Word document.***

*If this research is related to a grant, contract proposal or dissertation, a copy of the full grant/contract proposal/dissertation must accompany this application.*

### A. Investigator Information

**Principal Investigator** (PI cannot be a student): Peter Tarasewich

Investigator is (circle one) NU Faculty: NU Staff: Other:

Department: College of Computer and Information Science

Address: 440 Huntington Ave, 202 WVH, Boston, MA 02115 USA

Telephone: [REDACTED] Email: tarase@ccs.neu.edu

Is this student research? YES: X NO: *If YES, provide the following information:*

**Student Name:** Richard Conlan Undergrad: MA/MS: PhD: X

Campus Address: [REDACTED] Anticipated graduation date: April 2009

Telephone: [REDACTED] Email: kaige@ccs.neu.edu

**Contact Person: Peter Tarasewich**

Tel: [REDACTED]

Address: 440 Huntington Ave, Boston, MA 02115 USA

E-mail: tarase@ccs.neu.edu

### B. Protocol Information

Title: Improving Interface Designs to Help Users Choose Better Passwords

Projected # subjects: 70 Begin date of project: 04/24/2006 End date:  
month, day, year month, day, year

Anticipated funding source for project (or none): none

Has/will this proposal been/be submitted through: DSPA: Provost: Corp & Foundations:

*For HSRRC use.*

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Date Received \_\_\_\_\_ HSRRC No. \_\_\_\_\_

### C. Participant and Project Information

Will Participants be:	Yes	No	Does the project involve:	Yes	No
Children (under age 18)?		x	Blood removal?		x
Northeastern U. Students	X		Investigational Drug/Device?		x
Institutionalized Persons/Prisoners?		x	Audiotapes/Videotapes?		x
Cognitively Impaired Persons?		x			
Non or Limited English Speaking?		x			
People Living Outside the USA?		x			
Pregnant Women/Fetuses?		x			

*Please answer each of the following questions using non-technical language. Missing or incomplete answers will delay your review while we request the information.*

### D. Define the Goals of this Research.

This research investigates how the user interface of the password selection mechanism used when a user is choosing a new password affects the quality of the password. We wish to examine the password data gathered by the Dropbox-Online (<https://www.dropbox-online.com>) homework submission system and analyze it to determine whether there is any relation between the user interface used when choosing a new password and the quality of the passwords chosen by users of the system. Dropbox-Online employs the four password selection applets viewable at <https://www.dropbox-online.com/changePassword.html>.

### E. Provide a brief summary in non-technical language.

The PI and student researcher have been conducting research into how the design of the human computer interface affects various security aspects of computing systems. The study described herein is focused on how the interface affects the quality of passwords. The vast majority of computing systems in use today are protected by passwords, and as such the security offered depends entirely on the quality of the passwords chosen. It has long been held as conventional wisdom that users are unable to choose strong passwords. In practice users often choose rather poor passwords – such as the names of pets or loved ones, dates of special significance, common phrases, or dictionary words. Even when users are advised that they should vary their password by adding numbers or punctuation they tend to make very small modifications, such as choosing “Megan9” instead of just “Megan.” Unfortunately, these minor modifications do not make the password much stronger.

However, we feel the conclusion that users cannot choose good passwords has been made too hastily. At current there is little research exploring the possibility of improving password quality by improving the password selection interface. We believe that a large part of the problem users have choosing good passwords is that they cannot tell the difference between a good password and a bad password. In general a good password is one that is hard to guess or otherwise break – this tends to require a good mixture of words, numbers, and symbols of sufficient length. What is a good mixture? What is sufficient length? Each of the password selection interfaces in the Dropbox-Online (<http://www.dropbox-online.com>) homework submission system are designed to give the user appropriate feedback on the quality of their passwords as they are chosen, which we feel will lead to stronger passwords.

Throughout the semester the students of [REDACTED] have been using Dropbox-Online, which was written by researcher Richard Conlan. The system was designed as a streamlined alternative to Blackboard and for the development of four password selection applets (<https://www.dropbox-online.com/changePassword.html>). The applets had been intended for use in focused lab studies, but during the semester we realized that the data this system collected in the course of completing its intended functions could potentially be examined to yield deeper insights into the relation between the password selection user interface the quality of passwords students had chosen. We would like to examine this data to measure whether the different applets had a meaningful effect on password quality.

**F. Identify study personnel on this project. Include name, credentials, role, organization affiliation.**

Peter Tarasewich, Assistant Professor of Information Science, Principal Investigator, College of Computer & Information Science, Northeastern University.

Richard Conlan, Graduate Student, Student Researcher, College of Computer & Information Science, Northeastern University.

**G. Identify other organizations or institutions that are involved. Attach current Institutional Review Board (IRB) approvals or letters of permission as necessary.**

None.

**H. Recruitment Procedures**

*Describe the participants you intend to recruit. Provide all inclusion and exclusion criteria. Include age range, number of subjects, gender, ethnicity/race, socio-economic level, literacy level and health (as applicable) and reasons for exempting any groups. Describe how/when/by whom inclusion/exclusion criteria will be determined.*

Subjects for data analysis will be students from the [REDACTED] sessions of [REDACTED]. There will be no exclusion of participants based on age, gender, origin, or ethnicity (although participants must be at least 18 years old). It is expected that the study will use 75 subjects. However, as the class-size is fixed and we cannot know how many students will choose to participate it may be the case that we end up with fewer than the hoped for number. It is necessary that subjects be acquired from this population due to the nature of the data.

*Describe the procedures that you will use to recruit these participants. Be specific. How will potential subjects be identified? Who will ask for participation? If you intend to recruit using letters, posters, fliers, ads, website, email etc., copies must be included as attachments for stamped approval. Include scripts for intended telephone recruitment.*

Subjects will be recruited by the Student Researcher handing out the consent forms to the assembled class, verbally explaining the purpose of the study and answering all questions asked, and then asking those who wish to participate to give consent. It will be made clear that students need not participate and participation will have no impact on grades or class standing. This will be done once for [REDACTED].

*What remuneration, if any, is offered?*

None.

## **I. Consent Process**

*Describe the process of obtaining informed consent. Be specific. How will the project and the participants' role be presented to potential participants? By whom? When? Where? Having the participant read and sign a consent statement is done only after the researcher provides a detailed oral explanation and answers all questions. Include a copy of informed consent statements that you intend to use, if applicable. If translations are necessary, you may wish to wait until the consent statement has final approval in English.*

The study, and the participants' role in it, will be verbally explained to the assembled class by the Student Researcher before any data examination takes place. Each subject will have the opportunity to ask questions about the study, its procedures, and the collection of data. After all questions have been answered to the class's satisfaction, the students will have the opportunity to read and sign a statement of consent. Those that do not consent will be free to keep the forms regardless and need not turn anything in.

*If your population includes children, prisoners, people with limited mental capacity, language barriers, problems with reading or understanding, or other issues that may make them vulnerable or limit their ability to understand and provide consent, describe special procedures that you will institute to obtain consent appropriately. If participants are potentially decisionally-impaired, how will you determine competency?*

Not applicable.

## **J. Study Procedures**

*Provide a detailed description of all activities the participant will be asked to do and what will be done to the participants. Include the location, number of sessions, time for each session, and total time period anticipated for each participant, including long term follow up.*

The participants will not have to complete any actions in association with the study. We are merely seeking authorization to harvest password data from the Dropbox-Online system and conduct an analysis of that data.

*Who will conduct the experimental procedures, questionnaires, etc? Where will this be done? Include copies of all questionnaires, interview questions, tests, instruments, etc.*

The Student Researcher and PI will work to analyze the password data, but as stated above, this will require no action on the part of study participants. It could be argued that subjects had to change their passwords at varying points throughout the semester, but this would have been true whether or not we conducted this study and merely reflects the nature of an online homework submission system.

## **K. Risks**

*Identify possible risks to the participant as a result of the research. Consider possible psychological harm, loss of confidentiality, financial, social, or legal damages as well as physical risks. What is the seriousness of these risks and what is the likelihood that they may occur?*

Subjects are at minimal risk from this study. The only real risk we can conceive is if somebody were to gain access to the password data and misuse it. However, since the data will be stored anonymously this is not of high concern. In addition, this danger exists regardless of our undertaking the study since the Dropbox-Online system had to store it anyways to allow students to securely login to the system.

*Describe in detail the safeguards that will be implemented to minimize risks. What follow-up procedures are in place if harm occurs? What special precautions will be instituted for vulnerable populations?*

Confidentiality will be maintained as described below. In addition we will store all password data on removable media encrypted under strong public key cryptography where the keys will be stored elsewhere. This means an attacker would have to find and steal the removable media itself, find and steal the cryptographic key, and then somehow associated the data with the original participants. We view an attacker succeeding at this as very unlikely.

## **L. Confidentiality**

*Describe in detail the procedures that will be used to maintain anonymity or confidentiality during collection and entry of data. Who will have access to data? How will the data be used, now and in the future?*

All data collected will be aggregated for analysis into a master database that contains no identifying information. Subjects' participation in this study is confidential. No one outside of the Principal Investigator and the Student Researcher will know who participated in the study. Scientific reports will be based on group data and will not identify any individual as being part of this project.

*How and where will data be stored? When will data, including audiotapes and videotapes, be destroyed? If data is to be retained, explain why. Will identifiers or links to identification be destroyed? When? Signed consent documents must be retained for 3 years following the end of the study. Where and how will they be maintained?*

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## **M. Benefits**

*What benefits can the participant reasonably expect from his/her involvement in the research? If none, state that. What are potential benefits to others?*

There are no direct benefits to the subjects. However, the study is expected to provide insights into the ways in which user interface designs affects password quality. This knowledge could well be applied in manners that rendered many computing systems safer by helping to facilitate the use of better passwords. To the extent that such improved systems become available to the subjects, they will directly benefit from increased security, as will a potentially very large pool of users.

## **N. Attachments**

**Identify attachments that have been included and those that are not applicable (n/a).**

☐\_n/a\_ Copy of fliers, ads, posters, emails, web pages, letters for recruitment

☐\_n/a\_ Scripts of intended telephone conversations

☐\_n/a\_ Copies of IRB approvals or letters of permission from other sites

☒\_x\_ Informed consent statement (Approved form must be stamped by HSRRC before use)

☐\_n/a\_ Copies of all instruments, surveys, focus group or interview questions, tests, etc.

☒\_x\_ Signed assurance of principal investigator (required)