Notice of Approval: New Submission

April 18, 2019

Principal Investigator  Michael Bailey
CC  Joshua Reynolds, Joshua Mason, Deepak Kumar, Paul Murley, Zane Ma
Protocol Title  Two-Factor Authentication Feedback Survey
Protocol Number  1976
Funding Source  Funded
Review Type  Exempt 2
Status  Active
Risk Determination  No more than minimal risk
Approval Date  April 18, 2019
Closure Date  April 17, 2024

This letter authorizes the use of human subjects in the above protocol. The University of Illinois at Urbana-Champaign Institutional Review Board (IRB) has reviewed and approved the research study as described.

The Principal Investigator of this study is responsible for:

• Conducting research in a manner consistent with the requirements of the University and federal regulations found at 45 CFR 46.
• Using the approved consent documents, with the footer, from this approved package.
• Requesting approval from the IRB prior to implementing modifications.
• Notifying OPRS of any problems involving human subjects, including unanticipated events, participant complaints, or protocol deviations.
• Notifying OPRS of the completion of the study.
**Human Subjects Research – Protocol Form**

**Guidelines for completing this research protocol:**
- Please submit typed applications via email. Handwritten forms and hard copy forms will not be accepted.
- For items and questions that do not apply to the research, indicate as “not applicable.”
- Provide information for all other items clearly and avoid using discipline specific jargon.
- Please only include text in the provided boxes. The text boxes will expand as they are typed in to accommodate large amounts of text.

**Before submitting this application, ensure that the following have been completed.**
- Protocol Form is complete.
- Relevant CITI modules have been completed for all members of the research team at [www.citiprogram.org](http://www.citiprogram.org).
- Informed consent/assent/parental permission document(s) are provided.
- Relevant waivers and appendices are provided.
- Recruitment materials are provided.
- Research materials (e.g. surveys, interview guides, etc.) are provided.
- Any relevant letters of support are provided.

Instructions on the non-exempt review process and guidance to submitting applications, can be found on the OPRS website. You may also contact OPRS by email at irb@illinois.edu or phone at 217-333-2670.

**Submit completed applications via email to:** irb@illinois.edu.
### Section 1: PRINCIPAL INVESTIGATOR (PI)

The Illinois Campus Administrative Manual allows assistant, associate, and full professors to act as PI. Other individuals may serve as PI after obtaining approval from the necessary party.

<table>
<thead>
<tr>
<th>Last Name: Bailey</th>
<th>First Name: Michael</th>
<th>Degree(s): PhD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dept. or Unit: ECE</td>
<td>Office Address: 444CSL</td>
<td></td>
</tr>
<tr>
<td>Street Address: 1308 W Main St.</td>
<td>City: Urbana</td>
<td>State: IL</td>
</tr>
<tr>
<td>Phone: 217-244-8830</td>
<td>E-mail: <a href="mailto:mdbailey@illinois.edu">mdbailey@illinois.edu</a></td>
<td></td>
</tr>
</tbody>
</table>

Urbana-Champaign Campus Status:
- Faculty
- Academic Professional/Staff

(Student Investigators cannot serve as PI)

Training
- Required CITI Training, Date of Completion (valid within the last 3 years), 2/16/18
- Additional training, Date of Completion,

### Section 2. RESEARCH TEAM

2A. Are there other investigators engaged in the research?
- Yes (include a Research Team Form)
- No

2B. If yes, are any of the researchers not affiliated with Illinois?
- Yes
- No

### Section 3. PROTOCOL TITLE

Two-Factor Authentication Feedback Survey

### Section 4. FUNDING INFORMATION

4A. Is the research funded?
- Research is not funded and is not pending a funding decision (Proceed to Part 5).
- Research is funded (funding decision has been made).
- Funding decision is pending. Funding proposal submission date:

4B. Indicate the source of the funding.
- University of Illinois Department, College or Campus, please specify:
- Federal, please specify:
- Commercial Sponsorship & Industry, please specify:

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1 Clarify whether or not sponsor requires specific language in the contractual agreement that impacts human subjects research
2 Clarify whether or not the sponsor requires the protocol adhere to ICH GCP (E6) standards
Section 5. CONFLICTS OF INTEREST

Please indicate below whether any investigators or members of their immediate families have any of the following. If the answer to any of the following items is yes, please submit the University of Illinois approved conflict management plan. If you have any questions about conflicts of interest, contact coi@illinois.edu.

5A. Financial interest or fiduciary relationship with the research sponsor (e.g. investigator is a consultant for the research sponsor). [ ] Yes [ ] No

5B. Financial interest or fiduciary relationship that is related to the research (e.g. investigator owns a startup company, and the intellectual property developed in this protocol may be useful to the company). [ ] Yes [ ] No

5C. Two or more members of the same family are acting as research team members on this protocol. [ ] Yes [ ] No

Section 6. RESEARCH SUMMARY

6A. In lay language, summarize the objective and significance of the research.

Two factor authentication (2FA) is a recent trend in security to make it more difficult for attackers to take over user accounts. Adopting a mandatory 2FA policy is challenging and involves an institutional cost. Recent work has qualitatively described the effects on organizations and individuals of the change (see “It’s not actually that horrible” Colnago et al. CHI. 2018).

Our laboratory was approached by the security team at UIUC’s Technology Services with the request to design a campus survey which could simultaneously evaluate the recent two-factor authentication rollout, and support research into two-factor authentication deployment. We will run this survey, analyze it, and provide conclusions to UIUC Technology Services. We will also publish our findings.

This survey is intended to gather feedback from the UIUC students, faculty, staff, and affiliates who use UIUC’s new two-factor authentication solution which was recently implemented. It is specifically crafted...
to mirror questions also asked at Carnegie Mellon University in the above cited paper to allow for meaningful comparison of the experiences observed at each campus. The goal of this research is to learn what lessons can be drawn from UIUC’s experience that will either support or refute conclusions observed in other studies at other organizations. UIUC’s large organizational size makes it an ideal location for a study of two-factor adoption on a significant scale.

6B. Indicate if your research includes any of the following:
- [ ] Secondary data (use of data collected for purposes other than the current research project)
- [ ] Data collected internationally (include International Research Form)
- [ ] Translated documents (include Certificate of Translation Form and translated documents)
- [ ] Research activities will take place at Carle

6C. Letters of support from outside institutions or entities that are allowing recruitment, research, or record access at their site(s) are attached. [ ] Yes [ ] Not Applicable

Section 7. PERFORMANCE SITE

7A. List all research sites for the protocol. For non-University of Illinois at Urbana-Champaign sites, describe their status of approval and provide contact information for the site. If the site has an IRB, note whether the IRB has approved the research or plans to defer review to the University of Illinois at Urbana-Champaign.

Performances Sites

<table>
<thead>
<tr>
<th>#</th>
<th>Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>UIUC</td>
</tr>
<tr>
<td>#2</td>
<td></td>
</tr>
<tr>
<td>#3</td>
<td></td>
</tr>
</tbody>
</table>

If there are additional performance sites, include them on an attachment and check here: [ ]

7B. Is this a multi-center study in which the Illinois investigator is the lead investigator, or the University of Illinois at Urbana-Champaign is the lead site? [ ] Yes [ ] No

If yes, answer 7C and 7D. If no, move to Section 8.

7C. Who is the prime recipient of funding, if funded? n/a

7D. What is the management and communication plan for information that might be relevant to the protection of research subjects (e.g. unanticipated problems involving risks to subjects, interim results, and protocol modifications)? n/a

Section 8. PARTICIPANTS

8A. For each performance site, indicate the estimated total number of participants.

<table>
<thead>
<tr>
<th>Performance Site</th>
<th># Male</th>
<th># Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 UIUC</td>
<td>19000</td>
<td>19000</td>
<td>38000</td>
</tr>
<tr>
<td>#2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTALS</td>
<td>19000</td>
<td>19000</td>
<td>38000</td>
</tr>
</tbody>
</table>

If additional performance sites are included on an attachment, check here: [ ]
8B. Select all participant populations that will be recruited.

Age:
- ✓ Adults (18+ years old)
- □ Minors (≤17 years old)
- □ Specific age range, please specify:

Gender:
- ✓ No targeted gender (both men and women will be recruited/included)
- □ Targeted gender, please indicate: □ Men/boys □ Women/girls □ Other, please specify:

Race/Ethnicity:
- ✓ No targeted race or ethnicity (all races and ethnicities will be recruited/included)
- □ Targeted race or ethnicity, please specify:

College Students:
- □ No targeted college population
- □ UIUC general student body
- ✓ Targeted UIUC student population, provide the instructor or course information, name of the departmental subject pool, or other specific characteristics: Students who have enabled two-factor authentication.
- □ Students at institution(s) other than UIUC, please specify:

Any research with students on UIUC’s campus needs to be registered with the Office of the Dean of Students.

Other:
- □ Inpatients
- □ Outpatients
- □ People who are illiterate or educationally disadvantaged
- □ People who are low-income or economically disadvantaged
- □ People with mental or cognitive disabilities or otherwise impaired decision-making capacities
- □ Adults with legal guardians
- □ People who are non-English speaking
- □ People with physical disabilities
- □ Pregnant or lactating women, human fetuses, and/or neonates
- □ Prisoners or people with otherwise limited civil freedoms
- ✓ Other, please specify: Employees and Affiliates of UIUC who use UIUC two-factor authentication

8C. Describe additional safeguards included in the protocol to protect the rights and welfare of the populations selected above.

Participation in the survey will be anonymous. It is also optional.

Section 9. RECRUITMENT

9A. Select all recruitment procedures that will be used.
- □ Student subject pool, please specify:
- ✓ Email distribution
MTurk, Qualtrics Panel, or similar online population, please specify:

☐ US Mail
☐ Flyers/brochures
☐ Website ad, online announcement (e.g. eWeek), or other online recruitment, please specify:
☐ Newspaper ad
☐ Verbal announcement
☐ Other, please specify:
☐ Not applicable (secondary data only)

9B. Drafts or final copies of all recruitment materials (including verbal scripts) are attached.
☒ Yes ☐ Not Applicable

9C. For each group of participants, describe the details of the recruitment process.
Technology Services will send out a Massmail email to all university students, staff, faculty, and affiliates who use two-factor authentication on their UIUC accounts. It will solicit optional, voluntary participation in the survey as a mechanism for providing feedback on the ongoing 2FA policy decisions at UIUC. We do not control the entire contents of that email sent by UIUC Technology Services, but the part inviting participants to take the survey will include the exact language given in the attached Recruitment.txt document.

Section 10. WITHHELD INFORMATION

10A. Do you propose to withhold information from subjects prior to or during their participation?
☐ Yes ☒ No
If yes, complete the rest of Section 10 and also submit the Alteration of Informed Consent Form. If no, move to Section 11.

10B. What information will be withheld? n/a

10C. Why does this information need to be withheld for the purposes of the research? n/a

10D. How will participants be debriefed? n/a

10E. A draft or final copy of a written debriefing that will be provided to participants is attached.
☐ Yes ☐ Not Applicable

Section 11. SCHOOL-BASED RESEARCH

If subjects will be recruited from Illinois public or private elementary or secondary schools, additional deadlines and procedures may apply. Criminal background clearances might be required. Special consideration must be given to the exclusion of protected populations. Please contact the School University Research Relations (researchplacements@education.illinois.edu) for more information.
Select one: ☐ Illinois schools will be used ☒ Illinois schools will not be used

Section 12. INCLUSION AND EXCLUSION CRITERIA

12A. List specific criteria for inclusion and exclusion of subjects in the study, including treatment and control groups.
Any person 18+ associated with the university and who uses 2FA will be invited to participate.

12B. Explain how the inclusion/exclusion criteria will be assessed and by whom. If special expertise is required to evaluate screening responses or data, list who will make this evaluation and describe their training and experience.

Technology Services will use its records of which persons have 2FA enabled for their accounts. The consent form will ask participants to certify they are at least 18 years of age.

12C. Drafts or final copies of all screening materials are attached. [ ] Yes [x] Not Applicable

12D. Describe procedures to assure equitable selection of subjects. Justify the use of the groups marked in Section 8B. Selection criteria that target one sex, race, or ethnic group require a clear scientific rationale.

Section 13. DEVICES & EQUIPMENTS

Indicate if your research includes any of the following.

[ ] Equipment [Researchers collecting physiological data, not testing the device]  
   (include Appendix A, the Research Equipment Form)

[ ] Devices [Researchers planning to test devices on human subjects]  
   (include Appendix B, the Device Form)

[ ] Materials of Human Origin  
   (include Appendix C, the Biological Materials Form)

[ ] Drugs and Biologics  
   (include Appendix D, the Drug and Chemical Usage Form)

[ ] MRI AT BIC To use the Beckman Institute Biomedical Imaging Center (BIC) in human subject’s research, you must obtain prior approval from the BIC (217.244.0446; ryambert@illinois.edu) and use BIC-approved screening and consent forms. Attach:
   [ ] BIC approval  [ ] BIC screening form  [ ] BIC consent form

Section 14. RESEARCH PROCEDURES

14A. Select all research methods and/or data sources that apply.

[✓] Surveys or questionnaires, select all that apply: [ ] Paper  [ ] Telephone  [✓] Online

[ ] Interviews

[ ] Focus groups

[ ] Field work or ethnography

[ ] Standardized written, oral, or visual tests

[ ] Taste or smell testing

[ ] Intervention or experimental manipulation

[ ] Exercise and muscular strength testing

[ ] Noninvasive procedures to collect biological specimens (e.g., hair and nail clippings, saliva, etc.)

[ ] Noninvasive procedures to collect physiological data (e.g., physical sensors, electrocardiography, etc.)

[ ] Procedures involving radiation
Protocol Form

- Recording audio and/or video and/or taking photographs
- Recording other imaging
- Materials that have already been collected or already exist, specify source of data:
  - HIPAA-protected data
  - FERPA-protected data
  - GDPR-protected data
  - Other, please specify:

14B. List all testing instruments, surveys, interview guides, etc. that will be used in this research. Survey

Drafts or final copies of all research materials are attached. ☑ Yes

14C. List approximate study dates. As soon as possible

14D. What is the duration of participants’ involvement? 5-10 minutes

14E. How many times will participants engage in research activities? once

14F. Narratively describe the research procedures in the order in which they will be conducted.

Participants will read the Technology Services Massmail and decide to participate. Participants will provide informed consent. Participants will answer the questions in the survey and then click the submit button.

Section 15. SUBJECT REMUNERATION

Refer to the University Business and Financial Policies and Procedures for further guidance on the compensation process and reporting requirements.

15A. Will subjects receive inducements or rewards before, during, or after participation?

☐ Yes ☑ No

If yes, complete the rest of Section 15. If no, move to Section 16.

15B. Select all forms of remuneration that apply.

☐ Cash, please specify amount:
☐ Check, please specify amount:
☐ Gift Certificate, please specify amount:
☐ Lottery, please specify amount: and odds:
☐ Course Credit, please specify amount: and specify equivalent alternative activity:
☐ Other, please specify:

15C. Will payment be prorated before, during, or after participation?

☐ Yes, please specify how:
☐ No

15D. For each group of participants, describe the details of the remuneration plan, including how, when and by whom they will be notified.

15E. The information listed above is provided on the relevant consent forms.

☐ Yes
Section 16. SUBJECT OUTLAY
Will subjects incur costs for research-related procedures (e.g. longer hospitalization, extra tests, use of equipment, lost compensation, transportation over 50 miles, etc.)?
☑ No ☐ Yes, please explain:

Section 17. CONFIDENTIALITY AND PRIVACY
17A. How is participant data, records, or specimens identified when received or collected by researchers? Identifiers include, but are not limited to, name, date of birth, email address, street address, phone number, audio or video recordings, and SSN.
☑ No identifiers are collected
☐ Direct identifiers are collected
☐ Indirect identifiers (e.g. a code or pseudonym used to track participants);
□ Does the research team have access to the identity key? ☑ Yes ☐ No

17B. Select all methods used to safeguard research records during storage:
☐ Written consent, assent, or parental permission forms are stored separately from the data
☑ Data is collected or given to research team without identifiers
☑ Data is recorded by research team without identifiers
☐ Direct identifiers are removed from collected data as soon as possible
☐ Direct identifiers are deleted and no identity key exists as soon as possible
☐ Participant codes or pseudonyms are used on all data and the existing identity key is stored separately from the data
☐ Electronic data is stored in a secure, [UIUC-approved location, please specify]
☐ Hard-copy data is stored in a secure location on UIUC’s campus, [please specify]
☑ Other, [please specify]: Data will be stored long-term on password-protected lab servers in the FERPA-compliant, access-controlled UIUC Advanced Computer Building. Data will also be on password-protected computers during analysis.

17C. How long will identifiable data be kept? n/a

17D. Describe provisions to protect the privacy interests of subjects. No identifiers will be collected

17E. Describe the training and experience of all persons who will collect or have access to the data. All persons who will collect the data have experience performing academic research. The responsible primary investigator, Michael Bailey, has published over 60 academic papers, many of which involve human subjects and thus IRB approval. The secondary investigator (Joshua Reynolds) is a second-year PhD student who has been an author of two conference publications involving human subjects, for one of which he was also the secondary investigator. The other investigators are graduate students and a research scientist collaborating with them.

Section 18. INFORMED CONSENT PROCESS
18A. Indicate all that apply for the consent/assent/parental permission process.
### Section 18. Consent Form

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>18B. List all researchers who will obtain consent/assent/parental permission from participants.</strong> Consent will be obtained by our survey system electronically.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>18C. Describe the method for obtaining consent/assent/parental permission.</strong> Consent will be obtained by our survey system electronically.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>18D. Describe when consent/assent/parental permission will be obtained.</strong> Before the survey begins</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>18E. Will participants receive a copy of the consent form for their records?</strong></td>
<td>No, if no, explain:</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>18F. Indicate factors that may interfere or influence the collection of voluntary informed consent/assent/parental permission.</strong></td>
<td>No known factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research will involve students enrolled in a course or program taught by a member of the research team</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research will involve employees whose supervisor(s) is/are recruiting participants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participants have a close relationship to the research team</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other, specify any relationship that exists between the research team and participants: If applicable, describe the procedures to mitigate the above factors.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>18G. Copies of the consent form(s) are attached.</strong></td>
<td>Yes</td>
<td>No</td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>18H. Will this project be registered as a clinical trial?</strong></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

If yes, effective January 21, 2019, an informed consent form must be posted on the Federal Web site after the clinical trial is closed to recruitment, and no later than 60 days after the last study visit.

### Section 19. Dissemination of Results

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>19A. List proposed forms of dissemination (e.g. journal articles, thesis, academic paper, conference presentation, sharing within industry, etc.).</strong> journal articles, thesis, academic paper, conference presentation, sharing within industry &amp; universities, etc</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>19B. Will any identifiers be published, shared, or otherwise disseminated?</strong></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>If yes, does the consent form explicitly ask consent for such dissemination, or otherwise inform participants that it is required in order to participate in the study?</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>19C. Do you intend to put de-identified data in a data repository?</strong></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>If yes, explain how data will be de-identified. Identifiers are never collected.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Section 20. RISKS & BENEFITS

<table>
<thead>
<tr>
<th><strong>20A.</strong> Describe all known risks to the participants for the activities proposed, such as risks to the participants' physical well-being, privacy, dignity, self-respect, psyche, emotions, reputation, employability, and criminal and legal status. Risks must be described on consent forms. Participants may be frustrated recalling their experience with 2FA.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>20B.</strong> Describe the steps that will be taken to minimize the risks listed above. Participants may choose not to participate or stop participating at any point.</td>
</tr>
</tbody>
</table>
| **20C.** Indicate the risk level.  
* No more than minimal risk  
(The probability and magnitude of harm or discomfort anticipated for participation in the proposed research are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests).  
* More than minimal risk (answer 20D) |
| **20D.** If you checked that the research is more than minimal risk, describe the provisions for monitoring the data to ensure the safety of subjects, such as who will monitor data and how often, what criteria will be used to stop the research, etc. |
| n/a |
| **20E.** Describe the expected benefits of the research to the subjects and/or to society. |
| No direct benefits are expected for participants. |
| **20F.** Weigh the risks with regard to the benefits. Provide evidence that benefits outweigh risks. |
| Risks are not expected to exceed those faced by participants in their everyday life; whereas, this survey will contribute to our understanding of the organizational challenges and costs of 2FA adoption, and it will allow the university to guide its 2FA policies. |

### Section 21. INVESTIGATOR ASSURANCES

- I certify that the information provided in this application is complete and correct.
- I certify that I will follow my IRB Approved Protocol.
- I accept ultimate responsibility for the conduct of this study, the ethical performance of the project, and the protection of the rights and welfare of the human subjects who are directly or indirectly involved in this project.
- I will comply with all applicable federal, state and local laws regarding the protection of human subjects in research.
- I will ensure that the personnel performing this study are qualified and adhere to the provisions of this IRB-certified protocol.

The original signature of the PI is required before this application may be processed (electronic signature are acceptable).
Section 22. DEPARTMENTAL ASSURANCE (OPTIONAL)
If the PI is not eligible to serve as PI under the Campus Administrative Manual, the applicable academic dean, institute director, or campus administrative officer indicates their approval of the researcher to act as Principal Investigator. Please note that departmental assurance only needs to be provided in the initial application.

Applicable Authorizing Officer

Date
For Listing Additional Researchers who are Involved in the Project

All forms must be typewritten and submitted via email to irb@illinois.edu.

When to use this form: If there are collaborating researchers participating in a research study, including those from other institutions, complete this form by listing all collaborating researchers. Include all persons who will be: 1) directly responsible for project oversight and implementation, 2) recruitment, 3) obtaining informed consent, or 4) involved in data collection, analysis of identifiable data, and/or follow-up. Please copy and paste text fields to add additional research team members.

Note:
- Changes made to the Principal Investigator require a revised Protocol Form and an Amendment Form.
- A complete Research Team form with all research team members included needs to be submitted every time the research team is updated.

### Section 1. PROTOCOL INFORMATION

<table>
<thead>
<tr>
<th>1A. Principal Investigator:</th>
<th>Michael Bailey</th>
</tr>
</thead>
<tbody>
<tr>
<td>1B. Protocol Number:</td>
<td></td>
</tr>
<tr>
<td>1C. Project Title:</td>
<td>Two-Factor Authentication Feedback Survey</td>
</tr>
</tbody>
</table>

### Section 2. ADDITIONAL INVESTIGATORS

<table>
<thead>
<tr>
<th>Full Name</th>
<th>Degree</th>
<th>Dept. or Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joshua Reynolds</td>
<td>B.S.</td>
<td>CS</td>
</tr>
<tr>
<td>Professional Email:</td>
<td><a href="mailto:joshuar3@illinois.edu">joshuar3@illinois.edu</a></td>
<td>Phone: 916-676-6076</td>
</tr>
<tr>
<td>Campus Affiliation:</td>
<td>University of Illinois at Urbana-Champaign</td>
<td>Other, please specify:</td>
</tr>
<tr>
<td>Campus Status:</td>
<td>Faculty</td>
<td>Academic Professional/Staff</td>
</tr>
<tr>
<td>Training:</td>
<td>Required CITI Training, Date of Completion (valid within last 3 years): 14 Sept 2017</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Additional training, Date of Completion:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>This researcher should be copied on OPRS and IRB correspondence.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Full Name</th>
<th>Degree</th>
<th>Dept. or Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joshua Mason</td>
<td>PhD</td>
<td>ECE</td>
</tr>
<tr>
<td>Professional Email:</td>
<td><a href="mailto:joshm@illinois.edu">joshm@illinois.edu</a></td>
<td>Phone:</td>
</tr>
<tr>
<td>Campus Affiliation:</td>
<td>University of Illinois at Urbana-Champaign</td>
<td>Other, please specify:</td>
</tr>
<tr>
<td>Campus Status:</td>
<td>Faculty</td>
<td>Academic Professional/Staff</td>
</tr>
<tr>
<td>Training:</td>
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</tbody>
</table>

Approved April 18, 2019
IRB #19706
**Research Team**

- **Required CITI Training**, **Date of Completion** (valid within last 3 years): Mar 5 2018
- This researcher should be copied on OPRS and IRB correspondence.

<table>
<thead>
<tr>
<th>Full Name: Deepak Kumar</th>
<th>Degree: B.S.</th>
<th>Dept. or Unit: CS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Email: <a href="mailto:dkumar11@illinois.edu">dkumar11@illinois.edu</a></td>
<td>Phone: 248-231-3575</td>
<td></td>
</tr>
</tbody>
</table>

- **Campus Affiliation:**
  - University of Illinois at Urbana-Champaign
  - Other, please specify:
- **Campus Status:**
  - Faculty
  - Academic Professional/Staff
  - Graduate Student
  - Undergraduate Student
  - Visiting Scholar
  - Other, please specify:

- **Training:**
  - Required CITI Training, **Date of Completion** (valid within last 3 years): 4/8/19
  - Additional training, **Date of Completion**:
  - This researcher should be copied on OPRS and IRB correspondence.

<table>
<thead>
<tr>
<th>Full Name: Paul Murley</th>
<th>Degree: M.S.</th>
<th>Dept. or Unit: CS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Email: <a href="mailto:pmurley2@illinois.edu">pmurley2@illinois.edu</a></td>
<td>Phone: 512-569-4645</td>
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</tr>
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</table>

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  - Undergraduate Student
  - Visiting Scholar
  - Other, please specify:

- **Training:**
  - Required CITI Training, **Date of Completion** (valid within last 3 years): 10/12/17
  - Additional training, **Date of Completion**:
  - This researcher should be copied on OPRS and IRB correspondence.

<table>
<thead>
<tr>
<th>Full Name: Zane Ma</th>
<th>Degree: B.S.</th>
<th>Dept. or Unit: CS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Email: <a href="mailto:zanema2@illinois.edu">zanema2@illinois.edu</a></td>
<td>Phone:(310)-498-0016</td>
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</tbody>
</table>

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  - Other, please specify:
- **Campus Status:**
  - Faculty
  - Academic Professional/Staff
  - Graduate Student
  - Undergraduate Student
  - Visiting Scholar
  - Other, please specify:

- **Training:**
  - Required CITI Training, **Date of Completion** (valid within last 3 years): 2/9/19
  - Additional training, **Date of Completion**:
  - This researcher should be copied on OPRS and IRB correspondence.
Technology Services has partnered with Dr. Michael Bailey's Network and Security Research Group to design a survey to measure the organizational effects of the recent two-factor authentication implementation and guide future policy decisions. The goal of the research is to publish overall findings to guide UIUC, other universities, businesses, and government entities which are making two-factor authentication policy decisions.

The survey is expected to take 5-10 minutes. Participation in this survey is voluntary and anonymous. Further details about the research and applicable regulatory approvals (IRB Protocol #19706) are given at the survey's consent-to-participate page. You can find the survey by copying and pasting the following link into your browser:

[URL for the survey]

If you would like to send feedback about 2FA, but would not like to be part of the research study, you may instead send an email to the Technology Services Help Desk at consult@illinois.edu.
The following survey appears if the participant selects the first option to provide consent.

Two-Factor Authentication Feedback Survey

* Required

1. Consent to Participate in Research

Key Information - You are being asked to participate in a voluntary research study. The purpose of this study is to gather feedback on the perceptions and effects of the recent two-factor authentication. Participating in this study will involve answering this survey and your participation will last approximately 5-10 minutes. Risks related to this research include feeling uncomfortable answering questions; there are no direct benefits to you for participating in this study. The alternative to participating in this study is to email feedback to Technology Services Help Desk at consult@illinois.edu.

Principal Investigator Name and Title: Associate Professor Michael Bailey, PhD
Department and Institution: Department of Electrical and Computer Engineering at the University of Illinois at Urbana-Champaign
Contact Information: mdbailey@illinois.edu *

What procedures are involved?
The study involves answering 18 survey questions. This research will be performed at this survey page. You will need to participate only once. The survey is expected to last 5-10 minutes.

Will my study-related information be kept confidential?
This survey is anonymous. We are not collecting any identifying information. Faculty, students, and staff who may see your information will maintain confidentiality to the extent of laws and university policies. Personal identifiers will not be published or presented.

Will I be reimbursed for any expenses or paid for my participation in this research?
You will not be offered payment for being in this study.

Can I withdraw or be removed from the study?
If you decide to participate, you are free to withdraw your consent and discontinue participation at any time. Your participation in this research is voluntary. Your decision whether or not to participate, or to withdraw after beginning participation, will not affect your current or future dealings with the University of Illinois at Urbana-Champaign.

Will data collected from me be used for any other research?
Your anonymous information could be used for future research without additional informed consent.

Who should I contact if I have questions?
If you have any questions about your rights as a participant in this study or any concerns or complaints, please contact the Office for the Protection of Research Subjects at 217-333-2670 or via email at irs@illinois.edu.

Please print this consent form if you would like to retain a copy for your records.

- I have read and understand the above consent form. I willingly and voluntarily consent to be part of this research and I certify that I am over the age of 18
- I do not consent to be part of this research or I am not over 18 years old

Submit
2. Which university roles do you have? (Mark all that apply)

☐ Undergraduate Student

☐ Graduate Student

☐ Faculty

☐ Staff

☐ Other

3. Did you sign up to use two-factor authentication (Duo 2FA) with UIUC systems before it was required? *

☐ Yes

☐ No

4. From which devices do you log into UIUC accounts on a regular day? (Mark all that apply)

☐ University-owned desktop/laptop

☐ Personally-owned desktop/laptop

☐ Public or shared computers

☐ Mobile Phone

☐ Tablet

☐ Other

5. Which two-factor authentication methods do you use for logging into UIUC accounts?

☐ Phone Call

☐ SMS Text Message

☐ Duo Mobile App

☐ C100 Token (Number Generator Keychain)

☐ Yubikey (USB Hardware Token)

☐ Temporary Passcode
6. I think that two-factor authentication is easy to use *
   - Strongly Agree
   - Somewhat Agree
   - Neutral
   - Somewhat disagree
   - Strongly disagree

7. I think that two-factor authentication is annoying to use *
   - Strongly Agree
   - Somewhat Agree
   - Neutral
   - Somewhat disagree
   - Strongly disagree

8. I think that two-factor authentication makes my account secure *
   - Strongly Agree
   - Somewhat Agree
   - Neutral
   - Somewhat disagree
   - Strongly disagree

9. Fill in the blank. I now think two-factor authentication is ______________ than I expected before I started using it for UIUC accounts. *
   - More Easy
   - Less Easy
   - More Annoying
   - Less Annoying
   - More Secure
   - Less Secure
10. How important is it for each of the following UIUC accounts to be protected by two-factor authentication? *

<table>
<thead>
<tr>
<th>Account Description</th>
<th>Very Important</th>
<th>Somewhat Important</th>
<th>Neutral</th>
<th>Somewhat Unimportant</th>
<th>Not at all Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payroll (like Nessie)</td>
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<tr>
<td>Email (like Outlook)</td>
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<tr>
<td>Business Cloud Applications (like Box and Google Apps)</td>
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<tr>
<td>Student Account Control (like Self-Service)</td>
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<tr>
<td>Grading Services (like Compass)</td>
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</tr>
</tbody>
</table>

11. For which types of non-UIUC accounts have you used two-factor authentication? (Mark all that apply)

- [ ] Online finance
- [ ] Social Media
- [ ] Email
- [ ] Other schools
- [ ] Other workplaces
- [ ] Online shopping
- [ ] Healthcare services
- [ ] Video gaming
- [ ] Other

12. How often do you sign into a UIUC website and do two-factor authentication? *

- [ ] Weekly or less
- [ ] Daily
- [ ] 2-5 times per day
- [ ] 6-10 times per day
- [ ] More than 10 times per day
13. How long does the 2FA process usually take you? *

- Less than 5 seconds
- 5-10 seconds
- 11-30 seconds
- 31-60 seconds
- More than 1 minute

14. It is reasonable for UIUC to ask me to run the Duo mobile app on my personal mobile device. *

- Strongly Agree
- Somewhat Agree
- Neutral
- Somewhat Disagree
- Strongly Disagree

15. Currently only two-factor authentication tokens (C100 or Yubikey) purchased at the UIUC webstore work with UIUC accounts. Would you like to use a different two-factor authentication token to log into your accounts? *

- Yes
- No
- No opinion

16. Would you like to use a two-factor authentication app besides the Duo app? *

- Yes
- No
- No opinion
17. This month, a "Remember Me" option to stay logged into UIUC accounts is being turned on. For how long would you feel safe staying logged in? 

- 12 hours
- 1 Day
- 1 Week
- 1 Month
- Forever on that specific device
- Forever

18. Which problems have you encountered with two-factor authentication at UIUC? (Mark any that apply)

- Had a hard time understanding how to set up two-factor authentication
- Had a hard time understanding how to use two-factor authentication
- Needed you phone or token but it was far away or lost
- Phone battery was dead
- Phone had no cell service or internet connection
- Two-factor message never arrived
- C100 token was out of sync
- Had to contact Help Desk to log in
- Account was hacked or taken over
- Other

19. What two-factor authentication requirements would you change?

Enter your answer
Two-Factor Authentication Feedback Survey

* Required

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I do not consent to be part of this research or I am not over 18 years old

Submit
Waiver of Documentation of Informed Consent

For Requesting a Waiver of the Documentation of Informed Consent
All forms must be typewritten and submitted via email to irb@illinois.edu.

Section 1. PROTOCOL INFORMATION

| 1A. Primary Investigator: Michael Bailey |
| 1B. Protocol Number: |
| 1C. Project Title: Two-Factor Authentication Feedback Survey |
| 1D. Is this research regulated by the US Food and Drug Administration? | Yes ☒ No |

Section 2. REQUEST FOR WAIVER OF DOCUMENTATION

A consent procedure which does not document obtained consent through a physical signature may be approved by the IRB under certain conditions. To request IRB approval of a consent procedure which does not document consent through a physical signature, provide a response to only one of the following. Note that the IRB may require the investigator to provide subjects with a written statement regarding the research, even though the documentation requirement may be waived.

- 2A. The only record linking the subject and the research would be the consent document and the principal risk would be potential harm resulting from a breach of confidentiality. Each subject will be asked whether the subject wants documentation linking the subject with the research, and the subject’s wishes will govern. (Note: A waiver of documentation of informed consent is not permissible under this category if the research is subject to FDA regulations.)
- 2B. The research presents no more than minimal risk of harm to subjects and involves no procedures for which written consent is normally required outside the consent. This statement applies. We will obtaining anonymous electronic consent without a signature.
- 2C. The subjects or legally authorized representatives are members of a distinct cultural group or community in which signing forms is not the norm, the research presents no more than minimal risk of harm to subjects, and there is an appropriate alternative mechanism for documenting that informed consent was obtained.