

CONSENT

Study ID: HUM00143064 IRB: Health Sciences and Behavioral Sciences Date Approved: 4/9/2018

Consent to Participate in a Research Study

Title of the Project: Automatically Detecting Broken Links in Email

Principal Investigator: Florian Schaub, Assistant Professor, University of Michigan

Co-investigator: Justin Petelka, Graduate Student, University of Michigan; Yixin Zou, Graduate Student, University of Michigan

Invitation to Participate in a Research Study

We invite you to be part of a study aimed at developing a method to automatically fix broken links in emails.

Description of Your Involvement

If you agree to be part of the research study, we will ask you to evaluate ten emails from thousands of real emails we have collected. For each email, we will ask

you to evaluate the hyperlinks and report if they work. Once you record your answers, we will ask you a few questions about yourself.

We anticipate this will **take about twenty five minutes**. Afterwards we will provide you with a code to receive your compensation through MTurk.

Requirements

To participate in this study, you must 1) be **18 years old or older**, 2) currently **live in the United States**, and 3) **have JavaScript enabled**. Our email client will not work without JavaScript enabled.

We will require responses to the email evaluations and the post-evaluation survey; however, the final section ("Demographics") will be entirely optional.

Benefits of Participation

There are no direct benefits to you from participating in this study. However, our research may lead to methods to automatically detect and fix broken links in emails, which has the potential to help organizations deliver emails with better content and reduce dissatisfaction.

Risks and Discomforts of Participation

The risks of participating in this study are no greater than those experienced during typical Internet use.

Compensation for Participation

For your participation in this research project, you will receive \$5.00 for completion of this survey through Amazon Mechanical Turk, as per the description of the human-intelligence task (HIT).

Confidentiality

Data you provide to us during this study will be used in research and may be published in publications and presentations. We will not include any information that could identify you but rather use anonymous ID numbers.

Voluntary Nature of the Study

Participating in this study is completely voluntary. Even if you decide to participate now, you may change your mind and stop at any time. If you decide to withdraw before this study is completed, simply close the browser. However, the Terms and Conditions of Amazon Mechanical Turk require completing the HIT for compensation. We regrettably are unable to provide compensation if you choose to withdraw.

Contact Information for the Study Team

If you have questions about this research, including questions about scheduling or your compensation for participating, you may contact the study team at emailTaggingSurvey@umich.edu.

Contact Information for Questions about Your Rights as a Research Participant

If you have questions about your rights as a research participant, or wish to obtain information, ask questions or discuss any concerns about this study with someone other than the researcher(s), please contact the:

University of Michigan Health Sciences and Behavioral
Sciences Institutional Review Board
2800 Plymouth Road
Building 520, Room 1169
Ann Arbor, MI 48109-2800
Phone: (734) 936-0933 or toll free, (866) 936-0933
Email: irbhsbs@umich.edu

Consent

By proceeding in this survey, you are agreeing to participate in the study. Be sure that we have

answered any questions you have about the study and that you understand what you are being asked to do. You may contact the researcher if you think of a question later.

If you agree to be a part of this study, please select "I Agree"

- ☐ I agree to participate in this study
- ☐ I do not wish to participate in this study

Instructions

Browser Meta Info

This question will not be displayed to the recipient.

Browser: **Firefox**

Version: **68.0**

Operating System: **Windows NT 10.0**

Screen Resolution: **1231x821**

Flash Version: **32.0.0**

Java Support: **0**

User Agent: **Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:68.0)**

Gecko/20100101 Firefox/68.0

Thank you for agreeing to participate in our study!

Your task is to examine each email and check if the hyperlinks in the email body are working.

To complete the task, we will give you access to an email inbox with ten emails randomly selected from our collection of emails:

Here is a list of specific instructions:

- (1) Log into the email client using the assigned credentials.
- (2) Open each email in order, starting from the email at the top.
- (3) For each email, report the subject line, check the hyperlinks in the email body, and record your observations in an evaluation survey in the next page. Please make sure you go through each link carefully as we will be recording your activity.

You can access our email client at: <https://emailresearch.si.umich.edu/mail/>. Please confirm that you were able to log into the inbox, as this is an essential part of being able to complete this task. If you have trouble logging in, please click "I'm having a problem logging in."

We're sorry you're having problems!

It would really help us to hear about what went wrong. Please let us know what problems you were having by emailing the investigators at:

emailtaggingsurvey@umich.edu

Unfortunately, until we investigate the cause of the problem, you are unable to complete this survey. We're sorry for any inconvenience this may have caused.

Click next to be taken to the end of the survey.

Evaluation_survey

These page timer metrics will not be displayed to the recipient.

First Click: *0 seconds*

Last Click: *0 seconds*

Page Submit: *0 seconds*

Click Count: *0 clicks*

You can access our email
client at: <https://emailresearch.si.umich.edu/mail/>.

Your username is: **$\{e://Field/username\}$**

Your password is: **$\{e://Field/password\}$**

Please open the **$\{Im://Field/1\}$** email and answer the
following questions.

Subject Line

Please copy the subject line and paste into the text
field below. This will help us identify which email you

are evaluating.

Number of Hyperlinks

Now please look for buttons, underlined texts or other interactive elements in the **email body** that indicate it might be a hyperlink.

How many hyperlinks are in this email?

Working Hyperlinks

Now please verify if each all the hyperlinks work (i.e. if you click the link, the page you expect should load). Note that you can choose more than one answer for this question.

- ☐ I **clicked all links**, but one or more links **do not load**.
- ☐ I **did not click all links**, because one or more links **are not clickable**.
- ☐ I **clicked all links**, but for one more more links, **access to the webpage was restricted**.
- ☐ I **clicked all links**, and they **all worked**.
- ☐ I **did not click all links**, because one or more links **are suspicious**.
- ☐ I **clicked all links**, but for one more more links, **the webpage was expired**.
- ☐ I **clicked all links**, but one or more links **are broken**.
- ☐ Other (please specify)

Now that you've finished evaluating the \$ {Im://Field/1} email, please move onto the next email. We recommend using the next arrows in the upper right corner for efficiency.

Please also click the arrow button on this page to access the next evaluation survey.

If you've finished evaluating all emails, please click the arrow button below and close the window/sign out. You will be automatically directed to an exit survey.

CYBERSECURITY KNOWLEDGE

These page timer metrics will not be displayed to the recipient.

First Click: *0 seconds*

Last Click: *0 seconds*

Page Submit: *0 seconds*

Click Count: *0 clicks*

Thank you for your help! We just have a few more questions.

What does the “https://” at the beginning of a URL denote, as opposed to http:// (without the “s”)?

- ☐ That the site is not accessible to certain computers
- ☐ That the site has special high definition
- ☐ That the site is the newest version available
- ☐ That information entered into the site is encrypted
- ☐ None of the above
- ☐ Not sure

Which of the following is an example of a “phishing” attack? [SELECT ALL THAT APPLY]

- ☐ Creating a fake website that looks nearly identical to a real website, in order to trick users into entering their login information
- ☐ Sending someone an email that contains a malicious link that is disguised to look like an email from someone the person knows
- ☐ Sending someone a text message that contains a malicious link that is disguised to look like a notification that the person has won a contest
- ☐ All of the above
- ☐ Not sure

A group of computers that is networked together and used by hackers to steal information is called a...

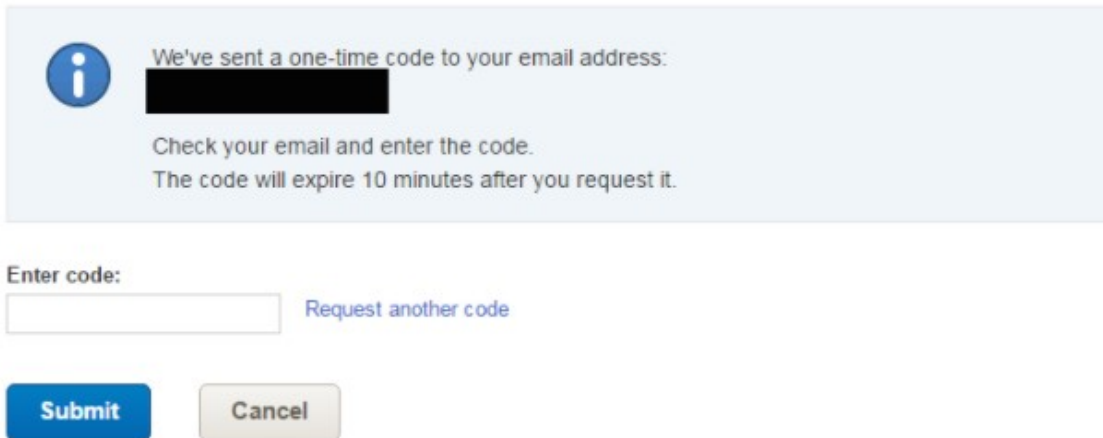
- ☐ Rootkit
- ☐ Botnet
- ☐ Operating system
- ☐ DDoS
- ☐ Not sure

All Wi-Fi traffic is encrypted by default on all wireless routers.

- ☐ True
- ☐ False
- ☐ Not sure

Some websites and online services use a security process called two-step authentication. Which of the following images is an example of two-step authentication? [SELECT ALL THAT APPLY]

☐ Click to select Picture 1



i We've sent a one-time code to your email address:
[redacted]
Check your email and enter the code.
The code will expire 10 minutes after you request it.

Enter code: [Request another code](#)

Submit **Cancel**

☐ Click to select Picture 2



morning overtake

Type the two words:

reCAPTCHA™ stop spam. read books.

☐ Click to select Picture 3

Please answer your security questions.

These questions help us verify your identity.

Who was your best childhood friend?

In which city did your mother and father meet?

Which of the following four passwords is the most secure?

- ☐ WTh!5Z
- ☐ into*48
- ☐ 123456
- ☐ Boat123
- ☐ Not sure

Criminals access someone's computer and encrypt the user's personal files and data. The user is unable to access this data unless they pay the criminals to decrypt the files. This practice is called...

- ☐ Driving
- ☐ Spam
- ☐ A botnet
- ☐ Ransomware
- ☐ None of the above
- ☐ Not sure

“Private Browsing” is a feature in many internet browsers that lets users access web pages without any information (like browsing history) being stored by the browser. Can internet service providers see the online activities of their subscribers when those subscribers are using private browsing?

- ☐ Yes
- ☐ No
- ☐ Not sure

Turning off the GPS function of your smartphone prevents any tracking of your phone's location.

- ☐ True
- ☐ False
- ☐ Not sure

All email is encrypted by default.

- ☐ True
- ☐ False
- ☐ Not sure

By law, how many free credit reports can Americans obtain in a calendar year from each of the three major credit bureaus?

- ☐ Zero
- ☐ One
- ☐ Five
- ☐ Three
- ☐ Not sure

If a public Wi-Fi network (such as in an airport or café) requires a password to access, is it generally safe to use that network for sensitive activities such as online banking?

- ☐ Yes, it's safe
- ☐ No, it is not safe
- ☐ Not sure

What kind of cybersecurity risks can be minimized by using a Virtual Private Network (VPN)?

- ☐ Use of insecure wi-fi networks
- ☐ Tracking by website operators
- ☐ Phishing attacks
- ☐ De-anonymization by network operators
- ☐ Key-logging
- ☐ Not sure

BRANDEXP

These page timer metrics will not be displayed to the recipient.

First Click: *0 seconds*

Last Click: *0 seconds*

Page Submit: *0 seconds*

Click Count: *0 clicks*

Thank you for completing the quiz! We would like to ask you some questions about large brand companies.

Do you currently have an account with any of the following companies? (You can select more than one answer to this question)

- ☐ Venmo
- ☐ Chase Bank (JP Morgan Chase)
- ☐ Yahoo
- ☐ I don't have an account with any of these companies.

How often do you receive emails from Venmo?

- ☐ Less than once a month
- ☐ Once a month
- ☐ Several times a month
- ☐ Once a week
- ☐ Several times a week
- ☐ Daily
- ☐ I'm not sure

How often do you receive emails from Chase?

- ☐ Less than once a month
- ☐ Once a month
- ☐ Several times a month
- ☐ Once a week
- ☐ Several times a week
- ☐ Daily
- ☐ I'm not sure

How often do you receive emails from Yahoo?

- ☐ Less than once a month
- ☐ Once a month
- ☐ Several times a month
- ☐ Once a week
- ☐ Several times a week
- ☐ Daily
- ☐ I'm not sure

PHISHING EXPERIENCE

These page timer metrics will not be displayed to the recipient.

First Click: *0 seconds*

Last Click: *0 seconds*

Page Submit: *0 seconds*

Click Count: *0 clicks*

Have you ever...?

	Yes	No	Don't know	Prefer not to answer
Received a notice that your social security number had been compromised	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Received a notice that other sensitive personal information, such as your account number, had been compromised	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Noticed fraudulent charges on your debit or credit card	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Had someone take over your email account without your permission	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Had someone take over your social media account without your permission	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Had someone attempt to open a line of credit or apply for a loan using your name	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Had someone attempt to receive a tax refund using your name	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Had any of your information stolen or compromised in some way by entering it into a website	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

condition_group

These page timer metrics will not be displayed to the recipient.

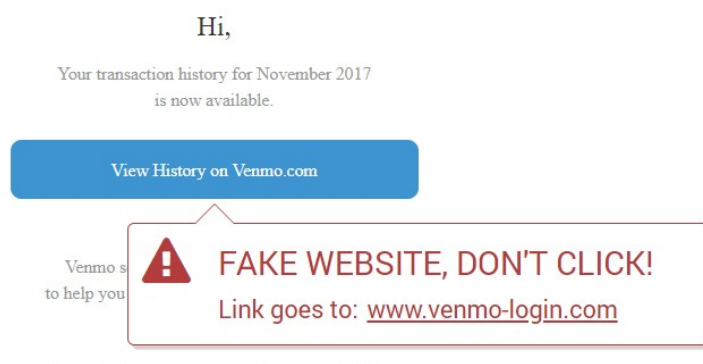
First Click: *0 seconds*

Last Click: *0 seconds*

Page Submit: *0 seconds*

Click Count: *0 clicks*

While checking these emails, did you see the following warning?



- ☐ Yes
- ☐ No
- ☐ I don't remember

While checking these emails, did you see the following warning?



- ☐ Yes
- ☐ No
- ☐ I don't remember

While checking these emails, did you see the following warning?



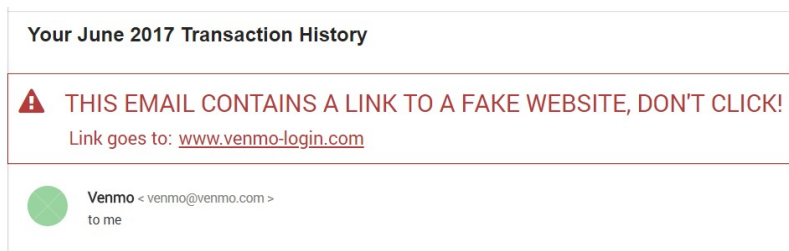
- ☐ Yes
- ☐ No
- ☐ I don't remember

While checking these emails, did you see the following warning?



- ☐ Yes
- ☐ No
- ☐ I don't remember

While checking these emails, did you see the following warning?



- ☐ Yes
- ☐ No
- ☐ I don't remember

While checking these emails, did you see the following warning?



FAKE WEBSITE AHEAD

You are about to enter the webpage **www.venmo-login.com**.

Click [here](#) to continue.

[Return to safety](#)

- ☐ Yes
- ☐ No
- ☐ I don't remember

Based on the warning, which parts of the email seemed suspicious to you?

- ☐ The email text
- ☐ The sender
- ☐ The date/time the email was sent
- ☐ The email recipient(s)
- ☐ The link shown in the email text
- ☐ The subject line
- ☐ The images
- ☐ The sender's organization
- ☐ The link shown in the status bar (the horizontal bar at the bottom of the screen/window)
- ☐ Other
- ☐ I don't remember

Did the warning affect your perception of the link?

- ☐ It did not affect me at all
- ☐ It affected me a little bit
- ☐ It affected me somewhat
- ☐ It affected me a little bit
- ☐ It affected me a lot

Please explain how the warning changed your perception of the link

How helpful was the warning in pointing out suspicious links?

- ☐ Not helpful at all
- ☐ A little bit helpful
- ☐ Somewhat helpful
- ☐ Helpful
- ☐ Very much helpful

Did you feel the warning was annoying?

- ☐ Not annoying at all
- ☐ A little bit annoying
- ☐ Somewhat annoying
- ☐ Very much annoying
- ☐ Extremely annoying

If you have any further feedback on how to improve the warnings, please let us know.

DEMOGRAPHIC

These page timer metrics will not be displayed to the recipient.

First Click: *0 seconds*

Last Click: *0 seconds*

Page Submit: *0 seconds*

Click Count: *0 clicks*

How would you describe your gender identity?

- ☐ Male
- ☐ Female
- ☐ Non binary/third gender
- ☐ Not listed, please specify
- ☐ Prefer not to answer

How old are you? Please type your age in years in digits, e.g., 18.

What is the highest level of education you have completed?

In what industry do you work?

Debrief and MTurk Reward Code

Debriefing for a study on phishing warnings in an email client

Thank you for taking the time to participate in our study.

While we initially described the purpose of this study as developing a method for automating broken link detection, **the true intention of this study was to evaluate the effectiveness of different phishing warnings.**

This deception was necessary in order to observe your natural behavior when confronted with the phishing warning in an email. **At no point during this study was your computer in danger of being compromised.** Please do not share the real purpose of this HIT with others.

Your participation in this experiment will help inform the design of future anti-phishing warnings that will make it easier for Internet users to spot and avoid suspicious links.

Please contact the study team at emailTaggingSurvey@umich.edu if you have any additional questions or feedback regarding this study.


MTurk code: **`${e://Field/reward_code}`**

Please copy and paste this code into MTurk now.

Thank you again for participating in our study.

Copy and paste your code into MTurk, then click the next arrow to submit your responses.

We are committed to improving our study. Any feedback you had about your experience during this study is greatly appreciated! Please leave us comments below:



Powered by Qualtrics