

View Details for PHSC-2021-06-23-15056-ochaparroarena**▼ Basic Info**

Protocol ID:	PHSC-2021-06-23-15056-ochaparroarena
Protocol Title:	Evaluating a conversational agent for bug reporting in Android applications
Overall Status:	active
Protocol Timeline:	Year 1 of 1
Committee(s):	PHSC
Campus:	Main
CC Email Addresses:	ysong10@email.wm.edu

▼ Comments

Comment by jastev (Stevens, Jennifer) 2021-07-20 07:57:51	<p>Dear Colleagues,</p> <p>Thank you for your PHSC submission. Your protocol is approved.</p> <p>Best wishes with your research project.</p> <p>Jennifer Stevens WM PHSC Chair</p>
Comment by jastev (Stevens, Jennifer) 2021-07-20 07:57:05	<p>Dear Colleagues,</p> <p>Thank you for your PHSC submission. Your protocol is approved.</p> <p>Best wishes with your research project.</p> <p>Jennifer Stevens WM PHSC Chair</p>

▼ Actions**▼ Status Info**

Submitted:	2021-06-23 23:47:37 by ochaparroarena
Overall Status:	active since 2021-07-20 07:58:31
PHSC Status:	expedited since 2021-07-20 07:58:31
expedited Criteria:	Category 07

▼ Date Info

Submitted:	2021-06-23 23:47:37 by ochaparroarena
Protocol Current Year Duration	2021-07-20 through 2022-07-20
Project Entire Duration	2021-07-20 through 2022-07-20

▼PI Info (dposhyvanyk)

Name:	Poshyvanyk, Denys
Acceptance:	accept since 2021-06-23 23:48:37
Role	Faculty
Department	Computer Science
Day/Work Phone	+1 7572213476
Day/Work Ext.	
Home/Evening/Emergency Phone	

▼PI Info (ochaparroarena)

Name:	Chaparro Arenas, Oscar Javier
Acceptance:	accept since 2021-06-23 23:47:37
Role	Faculty
Department	Computer Science
Day/Work Phone	+1 7572212144
Day/Work Ext.	
Home/Evening/Emergency Phone	

▼PI Info (ysong10)

Name:	ysong10,
Acceptance:	accept since 2021-06-23 23:51:41
Role	Graduate Student
Department	Computer Science
Day/Work Phone	+1 7576088123
Day/Work Ext.	
Home/Evening/Emergency Phone	

▼Emails

From compli@wm.edu (W&M Compliance) 2021-06-22 18:58:32	YOUR ASSISTANCE NEEDED FOR PROTOCOL DRAFT-15056-ysong10
From compli@wm.edu (W&M Compliance) 2021-06-23 22:27:34	YOUR ASSISTANCE NEEDED FOR PROTOCOL DRAFT-15056-ysong10
From compli@wm.edu (W&M Compliance) 2021-06-23 22:47:54	YOUR ASSISTANCE NEEDED FOR PROTOCOL DRAFT-15056-ysong10

From compli@wm.edu (W&M Compliance) 2021-06-23 23:34:11	YOUR ASSISTANCE NEEDED FOR PROTOCOL DRAFT-15056-ysong10
From compli@wm.edu (W&M Compliance) 2021-06-23 23:45:15	YOUR ASSISTANCE NEEDED FOR PROTOCOL DRAFT-15056-ysong10
From compli@wm.edu (W&M Compliance) 2021-06-23 23:47:38	YOUR RESPONSE NEEDED FOR PROTOCOL PHSC-2021-06-23-15056-ochaparroarena set to contingent
From compli@wm.edu (W&M Compliance) 2021-06-23 23:48:38	PRINCIPAL INVESTIGATOR RESPONSE TO PROTOCOL PHSC-2021-06-23-15056-ochaparroarena
From compli@wm.edu (W&M Compliance) 2021-06-23 23:51:43	ORIGINAL SUBMISSION FOR PROTOCOL PHSC-2021-06-23-15056-ochaparroarena
From compli@wm.edu (W&M Compliance) 2021-07-20 07:58:32	STATUS OF PROTOCOL PHSC-2021-06-23-15056-ochaparroarena set to active

▼Admin-Additional Information

If Funded, Agency Name(s) and internal W&M grant number:	Grant CCF-1955853 from NSF
Additional information:	Oscar Chaparro's start-up grant may be also used to fund this study.
Upload additional files - browse for a file then choose any save option below to upload it.	Questionnaires.docx

▼PHSC-Caveats when using the Protocol and Compliance Management System

▼PHSC-Protocol Description

Participants - Describe how/where subjects will be recruited, how many will participate in research, and their general characteristics such as age and gender. When appropriate, describe unique characteristics required for subjects' participation in study.	<p>This study will involve two types of participants: "bug reporters" and "bug reproducers". Bug reporters are participants with and without experience in reporting defects (aka bugs) in mobile applications (in particular, Android apps). Bug reproducers are participants with experience in software development; in particular, in replicating software bugs based on bug reports. All the participants should be familiar with using Android phones.</p> <p>All the participants will be contacted through our personal contact network. We will reach out primarily to (1) our family, acquaintances, and friends, and (2) students from W&M and other universities (mostly undergraduate and graduate students in computer science).</p> <p>Both males and females can participate in this study. The minimum age for participation is 18. The participants are volunteers. Participants will be recruited via email and social media (i.e., twitter).</p>
--	--

<p>Methods - Describe methods used to collect and analyze your data.*</p>	<p>We will utilize snowballing, where participants can forward the study to their friends/family. The number of participants could rise above 50 due to the use of snowballing.</p> <p>Our research lab has developed BURT, a web-based interface that allows end-users to report defects/bugs in Android applications. BURT is a chatbot that allows users to report bugs interactively. The user would engage in a conversation with BURT via text and result in the generation of a bug report containing the information provided by the user. This bug report is meant to be used by software developers for diagnosing and solving the bugs in the apps.</p> <p>We will conduct a user study that aims to assess how useful and effective BURT is in collecting high-quality bug reports, compared to other bug reporting interfaces (i.e., a traditional bug tracking system and FUSION, a state-of-the-art tool). We also aim to investigate whether the participants would like to use BURT in the future and to get feedback from them on how to improve BURT.</p> <p>To achieve these goals, our study is structured in two parts. Given the recent restrictions on person-to-person contact enacted to combat the spread of COVID-19, both parts of this study will be conducted in an online fashion. The participants need a computer with internet access to complete both parts.</p> <p>The first part aims to collect bug reports for a set of known bugs for some Android apps. The participants (i.e., the "bug reporters" group) will report these bugs using BURT, FUSION, and another system that we call ITRACKER, which resembles a traditional bug tracker.</p> <p>First, the participants will be trained on how to use the three bug reporting systems via a set of short video-based tutorials. Then, the participants will proceed to report a set of Android bugs. Specifically, for each bug, the participants will (1) get familiar with the Android app associated with the bug by using the app on a web-based Android emulator, (2) watch a short video that shows the bug, (3) try to replicate the bug in the app using the Android emulator, and (4) report the bug using one of the three bug reporting systems. We will run a Zoom or Skype call with the participants in case they have any questions or difficulties regarding these tasks.</p> <p>After all the bugs have been reported, the participants will answer an online questionnaire(see attachment, questionnaire1) intended to evaluate usability and user experience aspects of the bug reporting systems as well as collect feedback on how to improve BURT. Part of this questionnaire will be given as an online survey using Qualtrics, and the rest of it will be given in the form of interviews conducted via Zoom or Skype.</p> <p>We estimate this first part of the study will take each participant around 90 minutes.</p> <p>The second part of the study aims to know how easy it is for software developers to understand and reproduce the bugs described in the bug reports, collected in the first part of the study. The participants (i.e., the "bug reproducers" group) will read a set of the collected bug reports and try to replicate the reported bug. For each bug report, the participants will (1) get familiar with the Android app associated with the reported bug by using the app on a web-based Android emulator, (2) read and understand the bug described in the bug report, (3) try to replicate the bug in the Android emulator, and (4) answer an online questionnaire (see attachment, questionnaire2) for assessing how easy/difficult it was for them to understand the bug report and replicate the reported bug. We will run a Zoom or Skype call with the participants in case they have any questions/difficulties regarding these tasks.</p> <p>We estimate this second part of the study will take each participant around 60 minutes.</p> <p>For both parts, we will ask the participants to time themselves and provide the time it takes them to report and replicate each bug. Both parts will be conducted in separate sessions and may not necessarily involve the same participants.</p> <p>Before running study, we will conduct pilot studies involving a few participants and few bugs/bug reports.</p> <p>Each participant will be compensated with a \$10 - \$15 USD Amazon gift card upon the completion of each part of the study.</p>
<p>Brief Rationale - Within context of literature, explain why this work is important.</p>	<p>The main purpose of any bug reporting system (aka bug/issue tracker) is to collect high-quality bug information in an easy and enjoyable way for the reporter. Unfortunately, current issue trackers do not provide mechanisms to enforce high-quality information in bug reports, and frequently, bug reporters find it difficult to report bugs through these systems and end up submitting low-quality bug reports. Low-quality bug reports are unclear, ambiguous, and miss critical information. In consequence, developers often spend excessive time and effort triaging and solving the bugs, and, in many cases, they are unable to reproduce the problems, let alone solve the bugs in the code.</p>

	<p>One of the main causes for low-quality bug reports is the lack of interaction and guidance that current issue trackers may provide to bug reporters. Interactivity and guidance is very important because reporters often do not know what specific information they need to report and how to report this information. Additionally, users do not particularly enjoy reporting bugs. Current issue trackers implement passive bug reporting and lack mechanisms to verify the quality of the submitted bug information.</p> <p>We advocate for a paradigm shift in the way users report bugs, from passive to interactive bug reporting through intelligent and conversational systems. Therefore, we propose BURT, a web-based conversational agent for bug reporting. Whenever a user wants to report a bug, he/she would do it by interacting with BURT, which would guide him/her towards reporting all the information necessary for developers to diagnose and solve the bug in the software.</p> <p>BURT is currently geared towards bug reporting for Android applications</p>
<p>Privacy and Confidentiality - Include any statements necessary about protecting the privacy or confidentiality of collected data. 'Anonymous' is used when subjects' identities are not known. 'Confidential' is used if even indirectly - i.e. coding system - it is possible to connect a subject's responses/data to his/her true identity. If confidentiality is used, proper security must be assured by keeping code key under 'lock and key' conditions with only the investigator having access to that key.</p>	<p>All information collected about the activity of the participants will be kept confidential. The information will be kept in digital format, which can be accessed only by the investigators (i.e., the proper "lock and key" conditions will be enforced). When the results of this research are published or discussed in conferences, no information will be included that would reveal the identity of any of the participants.</p>
<p>Results - Explain how subjects will be apprised of outcome.</p>	<p>The participants will know about the aggregate results of the study when the results will be published at a conference or a journal venue. Additionally, they will be able to contact either of the PIs to learn additional details regarding the outcome of the study. Our contact information will be in the informed consent document.</p>
<p>Consent Form - Include the text of the form to be used in obtaining informed consent. In certain circumstances, where the signed informed consent form could link subjects to the data, the investigator may request waiving the requirement to obtain signed informed consent. If requesting such a waiver, please include justification. The investigator must still obtain informed consent, even if only verbally, after explaining to the subject the purpose of the research, procedures to be used, and subject's rights.</p>	<p>Note: the specific compensation for each part of the study is yet to be decided, but it will range between \$10 and \$15 USD (given via an Amazon gift card). This value will be updated in the consent form.</p> <p>*Consent for the first part of the study*</p> <p>Evaluating a conversational agent for bug reporting in Android applications</p> <p>You are invited to participate in a study conducted by Yang Song, Oscar Chaparro, and Denys Poshyvanyk from the College of William & Mary.</p> <p>The goal of this study is to evaluate a set of bug reporting systems for Android apps. If you decide to participate, the study will last for about 90 minutes in which you will be asked to report a set of Android app bugs (aka defects) using one or more bug reporting systems and answer a set of questions about your experience in using the systems. You will answer some of these questions through an online questionnaire and a conversation with one of us.</p> <p>Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. Your responses in this study will be kept confidential. You will be assigned a code number to protect your identity and all data will be kept secured. If you give us your permission by virtually agreeing to this study via email, we plan to disclose the results of the questionnaire in any publication resulting from this user study. The disclosed results will not be personally identifiable.</p> <p>If you decide to participate, you will be compensated with an Amazon gift card of \$15 USD upon completion of this user study.</p> <p>Your decision whether or not to participate will not prejudice your future relations with The College of William & Mary. If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time without penalty. The Committee on the Protection of Human Subjects at The College of William & Mary has reviewed and approved the present research.</p> <p>You must be at least 18 years old to participate.</p> <p>If you have any questions, please ask us. If you have any additional questions later, Yang Song (ysong10@email.wm.edu, 757-608-8123), Dr. Oscar Chaparro (oscarch@wm.edu, 757-221-2144) and Dr. Denys Poshyvanyk (denys@cs.wm.edu, 757-221-3476), will be happy to answer them.</p>

If you have concerns or dissatisfactions with this research study, please contact Dr. Jennifer Stevens, chair of the WM Protection of Human Subject Committee (PHSC). E-mail: jastev@wm.edu, Local telephone: (757) 221-2176, Toll free line: 1-888-905-0149.

You may keep a copy of this form.

YOU ARE MAKING A DECISION WHETHER OR NOT TO PARTICIPATE. YOUR REPLY TO THIS EMAIL INDICATES THAT YOU HAVE DECIDED TO PARTICIPATE, HAVING READ THE INFORMATION PROVIDED ABOVE.

Consent for the second part of the study

Replicating bugs of Android apps

You are invited to participate in a study conducted by Yang Song, Oscar Chaparro, and Denys Poshyvanyk from the College of William & Mary.

The goal of this study is to evaluate the content and reproducibility of a set of bug reports. If you decide to participate, the study will last for about 60 minutes in which you will be asked to read a set of bug reports, replicate the reported bugs (aka defects) for a set of Android app bugs, and answer a set of questions (via an online questionnaire) about your experience in using the systems.

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. Your responses in this study will be kept confidential. You will be assigned a code number to protect your identity and all data will be kept secured. If you give us your permission by virtually agreeing to this study via email, we plan to disclose the results of the questionnaire in any publication resulting from this user study. The disclosed results will not be personally identifiable.

If you decide to participate, you will be compensated with an Amazon gift card of \$15 USD upon completion of this user study.

Your decision whether or not to participate will not prejudice your future relations with The College of William & Mary. If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time without penalty. The Committee on the Protection of Human Subjects at The College of William & Mary has reviewed and approved the present research.

You must be at least 18 years old to participate.

If you have any questions, please ask us. If you have any additional questions later, Yang Song (ysong10@email.wm.edu, 757-608-8123), Dr. Oscar Chaparro (oscarch@wm.edu, 757-221-2144) and Dr. Denys Poshyvanyk (denys@cs.wm.edu, 757-221-3476), will be happy to answer them.

If you have concerns or dissatisfactions with this research study, please contact Dr. Jennifer Stevens, chair of the WM Protection of Human Subject Committee (PHSC). E-mail: jastev@wm.edu, Local telephone: (757) 221-2176, Toll free line: 1-888-905-0149.

You may keep a copy of this form.

YOU ARE MAKING A DECISION WHETHER OR NOT TO PARTICIPATE. YOUR REPLY TO THIS EMAIL INDICATES THAT YOU HAVE DECIDED TO PARTICIPATE, HAVING READ THE INFORMATION PROVIDED ABOVE

▼PHSC-Personnel Qualification

List personnel who will be performing the proposed procedures/research and indicate the training and number of years of experience of each person performing the procedures proposed. Personnel who will be collecting or potentially coming in contact with

Dr. Denys Poshyvanyk, Department of Computer Science, College of William & Mary
Dr. Oscar Chaparro, Department of Computer Science, College of William & Mary
Yang Song, Department of Computer Science, College of William & Mary

human tissues or fluids (e.g. blood or saliva collection), must be trained and ALSO obtain approval from the Institutional Biohazard Committee (IBC) by completing and submitting the IBC HUMAN TISSUE/FLUID REGISTRATION FORM. This form must be updated and resubmitted if any personnel changes occur.*

The CITI certificates for the personnel are attached.

Upload CITI (Collaborative Institutional Training Initiative, <https://www.citiprogram.org/>) training certificate(s) of completion for all personnel working under this protocol.

The uploaded document must be PDF.*

citiCompletionReport7685411.pdf

CITI-Area-Report-Denys 1.pdf

citiCompletionReport - June 10 2021.pdf

▼PHSC-General Registration Information

Your William and Mary role:*	Student (faculty member required as co-PI)
Advisor's Name:	Dr. Oscar Chaparro
Is this activity externally funded?*	Yes
Name of agency funding this project	NSF

▼PHSC-General Protocol Information

Will the participants be from a William and Mary course?	Yes
Will the participants be under 18 years old?	No
Can proper informed consent be obtained in advance of research?	Yes
Does this study involve any procedures likely to produce psychological or physical stress (e.g., failure, anxiety, pain, invasion of privacy, etc.)?	No
Is deception (active misleading) involved in the study?	No
Will subjects be informed that they may terminate participation at any time without penalty?	Yes
Even allowing for unusual circumstances, might any participants be disturbed by their participation?	No
Must this form be reviewed by other institutions?	No

▼PHSC-Health & Safety

Adherence to CDC recommendations-describe plans to meet requirements. CDC lab safety practices:

Our lab plans are to continue to maintain the recommendations from the CDC. Specifically, those who can and prefer to work remotely in our lab are encouraged to do so. A maximum number of people are allowed in the lab to allow for adequate social distancing between individual stations. For our lab, this is 2. We continue to follow WM guidelines as

https://www.cdc.gov/coronavirus/2019-ncov/lab/lab-safety-practices.html	well regarding face masks. Therefore, if multiple people are in the lab, they are required to wear a face mask regardless of vaccination status.
COVID assessment procedure(s) for lab personnel and research participants including recent symptoms, exposure, and temperature.*	Any people who are experiencing COVID-like symptoms are required to stay home and away from the lab. This includes lab personal and research participants. Additionally, the lab is cleaned daily to reduce risks in case of asymptomatic spread.
Risk assessment(s) for your lab and safety plan to protect lab personnel.*	Our current protocols and safety plans align with CDC recommendations. Additionally, this research as well as other research performed in our research group has transitioned to completely remote, including working with participants. Therefore, our risk assessment of our lab and safety plans is that we find a very low amount of risk to our lab personnel and participants.
Procedure(s) to be used to maintain social distancing.*	Currently, almost all lab personnel work from home and our policy of a maximum of two people inside the labs allows for maintaining social distancing. If more people are required to be inside the lab, rearrangements of stations will be performed to ensure proper social distancing is maintained
Plan(s) for use, distribution, and maintenance of face coverings.*	We continue to follow WM guidelines as well regarding face masks. Therefore, if multiple people are in the lab, they are required to wear a face mask regardless of vaccination status. Each person is responsible for bring and maintaining their own face mask.
Procedure(s) for personal hygiene and disinfection of all spaces and materials with multiple users.*	The lab is cleaned daily to reduce risks of COVID residing on surfaces for a prolong period of time. Additionally, hand sanitizer is provided in the lab.

▼PHSC-IAA: Inter-institutional Authorization Agreement

Will this project be subject to an Inter-institutional Authorization Agreement?*	No
If Yes, please list each institution below, and indicate approval status. When this is approved by the other institution(s), please append a copy of the IRB approval(s) to this protocol for record retention/documentation purposes.*	No