IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office for Responsible Research
Vice President for Research
1138 Pearson Hall
Ames, Iowa 50011-2207
515 294-4566
FAX 515 294-4267

Date: 11/23/2015

To: Dr. Kathryn Stolee
209 Atanosoff

From: Office for Responsible Research

Title: Regex Comprehension AB Study

IRB ID: 15-670

Study Review Date: 11/20/2015

The project referenced above has been declared exempt from the requirements of the human subject protections regulations as described in 45 CFR 46.101(b) because it meets the following federal requirements for exemption:

- (2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey or interview procedures with adults or observation of public behavior where
  - Information obtained is recorded in such a manner that human subjects cannot be identified directly or through identifiers linked to the subjects; or
  - Any disclosure of the human subjects' responses outside the research could not reasonably place the subject at risk of criminal or civil liability or be damaging to their financial standing, employability, or reputation.

The determination of exemption means that:

- **You do not need to submit an application for annual continuing review.**

- **You must carry out the research as described in the IRB application.** Review by IRB staff is required prior to implementing modifications that may change the exempt status of the research. In general, review is required for any modifications to the research procedures (e.g., method of data collection, nature or scope of information to be collected, changes in confidentiality measures, etc.), modifications that result in the inclusion of participants from vulnerable populations, and/or any change that may increase the risk or discomfort to participants. Changes to key personnel must also be approved. The purpose of review is to determine if the project still meets the federal criteria for exemption.

  Non-exempt research is subject to many regulatory requirements that must be addressed prior to implementation of the study. Conducting non-exempt research without IRB review and approval may constitute non-compliance with federal regulations and/or academic misconduct according to ISU policy.

  Detailed information about requirements for submission of modifications can be found on the Exempt Study Modification Form. A Personnel Change Form may be submitted when the only modification involves changes in study staff. If it is determined that exemption is no longer warranted, then an Application for Approval of Research Involving Humans Form will need to be submitted and approved before proceeding with data collection.

Please note that you must submit all research involving human participants for review. **Only the IRB or designees may make the determination of exemption**, even if you conduct a study in the future that is exactly like this study.

Please be aware that **approval from other entities may also be needed.** For example, access to data from private records (e.g. student, medical, or employment records, etc.) that are protected by FERPA, HIPAA, or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. **An IRB determination of exemption in no way implies or guarantees that permission from these other entities will be granted.**

Please don't hesitate to contact us if you have questions or concerns at 515-294-4566 or IRB@iastate.edu.

IRB ID: 15-670

INSTITUTIONAL REVIEW BOARD (IRB)

Exempt Study Review Form

Title of Project: Regex Comprehension AB Study

RECEIVED
NOV 09 2015
By IRB

Principal Investigator (PI): **Kathryn Stolee**			Degrees: PhD
University ID: **290280066**	Phone: 5152940222	Email Address: kstolee@iastate.edu	
Correspondence Address: 209 Atanasoff			
Department: Computer Science		College/Center/Institute: LAS	

PI Level: ☒ Tenured, Tenure-Eligible, & NTER Faculty ☐ Adjunct/Affiliate Faculty ☐ Collaborator Faculty ☐ Emeritus Faculty
☐ Visiting Faculty/Scientist ☐ Senior Lecturer/Clinician ☐ Lecturer/Clinician, w/Ph.D. or DVM ☐ P&S Employee, P37 & above
☐ Extension to Families/Youth Specialist ☐ Field Specialist III ☐ Postdoctoral Associate ☐ Graduate/Undergrad Student ☐ Other (specify:)

FOR STUDENT PROJECTS (*Required when the principal investigator is a student*)			
Name of Major Professor/Supervising Faculty:			
University ID:	Phone:	Email Address:	@iastate.edu
Campus Address:		Department:	
Type of Project: (check all that apply)	☐ Thesis/Dissertation	☐ Class Project	☐ Other (specify:)

Alternate Contact Person:	Email Address:
Correspondence Address:	Phone:

ASSURANCE

- I certify that the information provided in this application is complete and accurate and consistent with any proposal(s) submitted to external funding agencies. Misrepresentation of the research described in this or any other IRB application may constitute non-compliance with federal regulations and/or academic misconduct.
- I agree to provide proper surveillance of this project to ensure that the rights and welfare of the human subjects are protected. I will report any problems to the IRB. See Reporting Adverse Events and Unanticipated Problems for details.
- I agree that modifications to the approved project will not take place without prior review and approval by the IRB.
- I agree that the research will not take place without the receipt of permission from any cooperating institutions, when applicable.
- I agree to obtain approval from other appropriate committees as needed for this project, such as the IACUC (if the research includes animals), the IBC (if the research involves biohazards), the Radiation Safety Committee (if the research involves x-rays or other radiation producing devices or procedures), etc.; and to obtain background checks for staff when necessary.
- I understand that IRB approval of this project does not grant access to any facilities, materials, or data on which this research may depend. Such access must be granted by the unit with the relevant custodial authority.
- I agree that all activities will be performed in accordance with all applicable federal, state, local, and Iowa State University policies.

Signature of Principal Investigator — 11/9/2015 Date

Signature of Major Professor/Supervising Faculty Date
(*Required when the principal investigator is a student*)

- I have reviewed this application and determined that departmental requirements are met, the investigator(s) has/have adequate resources to conduct the research, and the research design is scientifically sound and has scientific merit.

Gianfranco Ciardo
Printed Name of Department Chair/Head/Director

X
Signature of Department Chair/Head/Director Date

For IRB Use Only	☐ Not Research Per Federal Regulations	☐ No Human Participants	Review Date: 11/20/15
	☑ Minimal Risk	EXEMPT Per 45 CFR 46.101(b): 2	
IRB Reviewer's Signature	Rok Ubapa	11/20/15	

Exempt Study Information

Please provide *Yes* or *No* answers, except as specified. Incomplete forms will be returned without review.

Part A: Key Personnel

1. **List all members and relevant qualifications of the project personnel and define their roles in the research.** Key personnel include the principal investigator, co-principal investigators, supervising faculty member, and any other individuals who will have contact with the participants or the participants' data (e.g., interviewers, transcribers, coders, etc.). This information is intended to inform the committee of the training and background related to the specific procedures that each person will perform on the project. For more information, please see Human Subjects – Persons Required to Obtain IRB Training.

NAME	Interpersonal contact or communication with subjects, or access to private identifiable data?	Involved in the consent process?	Contact with human blood, specimens, or other biohazardous materials?	Other Roles in Research	Qualifications (i.e., special training, degrees, certifications, coursework, etc.)	Human Subjects Training Date
Kathryn Stolee	☒	☒	☐	Analysis		~~10/4/2014~~ 8-22-13 ✓
Carl Chapman	☒	☒	☐	Analysis		~~5/21/2015~~ 9-9-15 ✓
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	☐	☐	☐			

Please complete additional pages of key personnel as necessary.

☐ Yes	☒ No	2. Does your study include children (persons under age 18) as research subjects?
		If ***Yes***, please read and respond to the following: ISU policy requires that background checks be completed for all researchers and key personnel who will have any contact with children involved in this research project. Details regarding this policy can be found here. **Principal Investigators and faculty supervisors are responsible** for ensuring that background checks are completed BEFORE researchers or key personnel may have any contact with children. Records documenting completion of the background checks must be kept with other research records (e.g., signed informed consent documents, approved IRB applications, etc.) and may be requested during any audits or Post-Approval Monitoring of your study.
	☐ Agreed	**2.a. Please check here to indicate that you have read this information and agree that you will comply with these requirements.**

Part B: Funding Information and Conflicts of Interest

☒ Yes	☐ No	1. Is or will the project be externally funded?
		If ***No***, skip to question 8.
		If ***Yes***, please identify the type(s) of source(s) from which the project is directly funded. ☐ Federal agency ☐ State/local government agency ☐ University or school ☐ Foundation ☐ Other non-profit institution ☐ For-profit business ☒ Other; specify: *Startup funds to Dr. Stolee*
☒ Yes	☐ No	2. Is ISU considered to be the Lead or Prime awardee for this project?
☐ Yes	☒ No	3. Are there or will there be any subcontracts issued to others for this project?
☐ Yes	☒ No	4. Is or will this project be funded by a subcontract issued by another entity?
☐ Yes	☒ No	5. If ISU is the recipient of the subcontract, does it involve any federal funding, such as federal flow-through funds?
6. If this project will be externally funded, please provide the complete name(s) of the funding source(s); please do not use acronyms. If any subcontracts will be issued to others, please describe and include a list of all entities.		

☐ Attached	7. Please attach a complete and final copy of the entire grant proposal or contract from which the project is or will be funded.
☐ Yes ☒ No	8. Do or will any of the investigators or key personnel listed on this application have a conflict of interest management plan in place with the Office of the Vice President for Research & Economic Development?

Part C: General Overview

Please provide a brief summary of the purpose of your study:

This study will focus on evaluating how well programmers can read and understand regular expressions. The end goal is to be able to refactor a given regular expression into a more readable regular expression with the same functionality, but this requires determining what is more readable.

Please provide a brief summary of your research design:

This study will be run on Amazon's Mechanical Turk. A qualification test will administer informed consent and test the participants for competency with regular expressions. Passing the competency portion and agreeing to the informed consent are required for participation.

We will provide participants with a set of 20 questions. Each question will be composed of a regular expression and a set of strings that it might match. The participant's job is to decide which of the strings are matched by the regex using a multi-select answer format. The participant will then compose a string that matches the regular expression. We will request that participants use their existing knowledge of regular expressions and do not use any online tools or consult documentation about regex features.

The 20 questions will be selected out of a pool of 40 questions, where each question is paired with another in that they contain regexes with identical funcion and also identical sets of strings. When a participant guesses incorrectly about the behavior of a regex, that will tell us that they struggled to read and understand it. Since the regexes are paired up, we can emperically deduce which regex is more readable, and from this we can infer some guidelines about how to make a regex more readable in general.

One example pair of questions might look like:

regex A: 'tri[a-f]3'

tria3
trih3
tri;3
abc3tri
triabcdef3

regex B: 'tri(a|b|c|d|e|f)3'

tria3
tri;3
abc3tri

trih3
triabcdef3

A participant would receive either regex A, or regex B.

Part D: Exemption Categories

☐ Yes ☒ No **1. Are you conducting research on Educational Practices (e.g., instructional techniques, curriculum effectiveness, etc.)? If *Yes*, please answer questions 1a through 1e. If *No*, please proceed to question 2.**

☐ Yes ☐ No **1.a.** Will the research be conducted in an established or commonly accepted educational setting, such as a classroom, school, professional development seminar, etc.?

☐ Yes ☐ No **1.b.** Will the research be conducted in any settings that would **not** generally be considered to be established or commonly accepted educational settings? If *Yes*, please specify: _____

☐ Yes ☐ No **1.c.** Will the research procedures and activities involve normal educational practices (e.g., activities that normally occur in the educational setting)? Examples include research on regular or special education instructional strategies or the effectiveness of instructional techniques, curricula, or classroom management methods.

☐ Yes ☐ No **1.d.** Will the research procedures include anything **other than** normal educational practices? If *Yes*, please specify: _____

☐ Yes ☐ No **1.e.** Will the procedures include randomization into different treatments or conditions, radically new instructional strategies, or deception of subjects? If *Yes*, please specify: _____

☒ Yes ☐ No **2. Does your research involve use of educational tests, survey procedures, interview procedures, or observations of public behavior? If *Yes*, please answer questions 2.a. through 2.b. If *No*, please proceed to question 3.**

☒ Yes ☐ No **2.a.** Will the research involve one or more of the following? (Check all that apply.)

- ☐ The use of educational tests (cognitive, diagnostic, aptitude, achievement)
- ☒ Surveying or interviewing adults
- ☐ Observations of public behavior* of adults
- ☐ Observations of public behavior* of children, when the researcher will not interact or intervene with the children

*Note: Activities occurring in the workplace and school classrooms are not generally considered to involve public behavior.

☐ Yes ☒ No **2.b.** Are **all** of the participants elected or appointed public officials or candidates for public office?

☐ Yes ☒ No **3.** **Does the research involve the collection or study of *currently existing* data, documents, records, pathological specimens, or diagnostic specimens? If *Yes*, please answer questions 3.a. through 3.b. If *No*, please proceed to question 4.**

☐ Yes ☐ No **3.a.** Are **all** of the data, documents, records, or specimens **publicly** available?

☐ Yes ☐ No **3.b.** Will the data you record for your study include ID codes? If *Yes*, please answer 3.b.(1) and 3.b.(2).

☐ Yes ☐ No **3.b.(1).** Does a "key" exist linking the ID codes to the identities of the individuals to whom the data pertains?

☐ Yes ☐ No **3.b.(2).** Will any persons on the research team have access to this key?

☐ Yes ☒ No **4.** **Does your research involve Taste and Food Quality tests and Consumer Acceptance Studies involving food? If *Yes*, please answer questions 4.a. through 4.c. If *No*, please proceed to question 5.**

☐ Yes ☐ No **4.a.** Is the food to be consumed normally considered wholesome, such as one would find in a typical grocery store?

☐ Yes ☐ No **4.b.** If the food contains additives, are the additives at or below the level normally considered to be safe by the FDA, EPA, or Food Safety and Inspection Service of USDA? Consider additives in commercially available foods found at a grocery store and/or any additives that are added to food for research purposes.

☐ Yes ☐ No **4.c.** If there are agricultural chemicals or environmental contaminants in the food, are they at or below the level found to be safe by the FDA, EPA, or Food Safety and Inspection Service of USDA?

☐ Yes ☒ No **5.** **Is your study a research or demonstration project to examine**

- **Federal** public benefit or service programs such as Medicaid, unemployment, social security, etc.; or
- Procedures for obtaining benefits or service under these programs; or
- Possible changes in or alternatives to those programs or procedures; or
- Possible changes in methods or levels of payment for benefits or services under these programs?

☐ Yes ☐ No **5.a.** If *Yes*, is the research or demonstration project pursuant to specific federal statutory authority?

Part E: Additional Information

☐ Yes ☒ No **6. Does your research involve any procedures that do not fit into one or more of the categories in items #1–#5 listed above, such as the following? (Check all that apply.)**

- ☐ Usability testing of websites, software, devices, etc.
- ☐ Collection of information from private records when identifiers are recorded
- ☐ Procedures conducted to induce stress, moods, or other psychological or physiological reactions
- ☐ Presentation of materials typically considered to be offensive, threatening, or degrading
- ☐ Video recording or photographing non-public behaviors
- ☐ Use of deception (e.g., misleading participants about the procedures or purpose of the study)
- ☐ Physical interventions, such as
  - ☐ blood draws
  - ☐ new collection of biological specimens
  - ☐ use of physical sensors (ECG, EKG, EEG, ultrasound, etc.)
  - ☐ exercise, muscular strength assessment, flexibility testing
  - ☐ body composition assessment
  - ☐ measuring of height and weight
  - ☐ x-rays
  - ☐ changes in diet or exercise
- ☐ Tests of sensory acuity (i.e., vision or hearing tests, olfactory tests, etc.)
- ☐ Consumption of food (other than as described in #4) or dietary supplements
- ☐ Clinical studies of drugs or medical devices
- ☐ Other; please specify: _____

☐ Yes ☐ No **6.a.** If *Yes*, is your research conducted in an established educational setting, **and** are the checked procedures part of normal educational practices given that setting? If *Yes*, please describe:

_____

☐ Yes ☒ No **7. Do you intend or is it likely that your study will include any persons from the following populations? (Check all that apply.)**

- ☐ Prisoners
- ☐ Cognitively impaired
- ☐ Children (persons under age 18)
- ☐ Wards of the State
- ☐ Persons who are institutionalized

7.a. If *Yes*, please describe how they will be involved and what procedures they will complete:

_____

☐ Yes ☒ No 8. Will any of the following identifiers be *linked to the data* at any time point during the research? (Check all that apply.)

- ☐ Names: ☐ First Name Only ☐ Last Name Only ☐ First and Last Name
- ☐ Phone/fax numbers
- ☐ ID codes that can be linked to the identity of the participant (e.g., student IDs, medical record numbers, account numbers, study-specific codes, etc.)
- ☐ Addresses (email or physical)
- ☐ Social security numbers
- ☐ Exact dates of birth
- ☐ IP addresses
- ☐ Photographs or video recordings
- ☐ Other; please specify: _____

☐ Yes ☒ No 9. **Is there a reasonable possibility that participants' identities could be ascertained from any combination of information in the data? If *Yes*, please describe:** _____

☒ Yes ☐ No 10. **Will participants' identities be kept confidential when results of the research are disseminated?**

☐ Yes ☒ No 11. **Could any of the information collected, if disclosed outside of the research, reasonably place the subjects at risk of any of the following? (Check all that apply.)**

- ☐ Criminal liability
- ☐ Civil liability
- ☐ Damage to the subjects' financial standing
- ☐ Damage to the subjects' employability
- ☐ Damage to the subjects' reputation

☐ Yes ☒ No 12. **Does the research, directly or indirectly, involve or result in the collection of any information regarding any of the following? (Check all that apply.)**

- ☐ Use of illicit drugs
- ☐ Criminal activity
- ☐ Child, spousal, or familiar abuse
- ☐ Mental illness
- ☐ Episodes of clinical depression
- ☐ Suicidal thoughts or suicide attempts
- ☐ Health history
- ☐ History of job losses
- ☐ Exact household income other than in general ranges
- ☐ Negative opinions about one's supervisor, workplace, teacher, or others to whom the subject is in a subordinate position
- ☐ Opinions about race, gender, sexual orientation, or any other socially sensitive or controversial topics
- ☐ Sexual preferences or behaviors
- ☐ Religious beliefs
- ☐ Any other information that is generally considered to be private or sensitive given the setting of your research; if so, please specify: _____

After completion of Parts A, B, and C of this application, please send the completed form to:

Institutional Review Board (IRB)
Office for Responsible Research
1138 Pearson Hall
Ames, IA 50011-2200

Data collection materials (e.g., survey instruments, interview questions, recruitment and consent documents, etc.) do not need to be submitted with this application.

If you have any questions or feedback, please contact the IRB office at IRB@iastate.edu or 515-294-4566.