RICE

Office of Research

INSTITUTIONAL REVIEW BOARD (IRB)

Date: July 29, 2013

To: Dr. James McLurkin
From: Jamie Peno, Compliance Administrator
CC: Dr. Aaron Becker

Protocol Number: 14-012E
Protocol Name: **Massive Manipulation: A n online user study on controlling large swarms of simple robots**
Subject: Protocol Approval
Approval Date: 07/26/2013
Expiration Date: 07/26/2014
Rice Federal-Wide Assurance Number: 00003890

After expedited review, the Institutional Review Board Chair has approved the above named and numbered protocol in accordance with Title 45, Part 46, Section 110 [Category 7] of the Code of Federal Regulations:

> *Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.*

In keeping with the requirements outlined in 45 CFR 46:109(e) and 21 CFR 56.109(f) the IRB shall conduct continuing review of all protocols at intervals appropriate to the degree of risk, but not less than once per year. You will be notified of the continuing review prior to the expiration date. You are responsible for promptly reporting to the IRB:

a) any severe adverse effects;
b) any unanticipated problems involving risks to subjects or others;
c) any proposed changes in the research activity (changes may not be initiated without IRB review and approval, except where necessary to eliminate apparent immediate hazards to the subjects).

The below noted approved documents are attached. This approval does not apply to any other versions of these documents.

☒ Protocol Application
☒ Consent Form(s)

If you have any questions, please do not hesitate to contact me by telephone at 713-348-3586 or by E-mail at jpeno@rice.edu.

WILLIAM MARSH RICE UNIVERSITY
INSTITUTIONAL REVIEW BOARD (IRB)
FOR THE PROTECTION OF HUMAN SUBJECTS FROM RESEARCH RISKS

APPLICATION FOR NEW PROTOCOL REVIEW

For applications requiring full board review, please access the following website for information regarding scheduled board meetings: http://osr.rice.edu/irb-dates.cfm

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For applications not requiring full board review (exempt or expedited), allow two (2) weeks for protocol review following receipt of all required documents.

FOR IRB USE ONLY	
PROTOCOL NO: 14-012E	**APPROVAL DATE:** 07/26/2013
MODIFICATION NUMBER ____	**MODIFICATION APPROVAL DATE**: ____
OSR NO: _____	

E-MAIL ALL FORMS TO jpeno@rice.edu. All protocols must be submitted by Principal Investigator.
Address questions to Compliance Administrator - Jamie Peno (jpeno@rice.edu; 713-348-3586).

The Principal Investigator and all researchers on the proposed project must complete the CITI online IRB training course **prior to initiation of the project.** Note that a passing grade of 80% is required for **each** module.

1. Activity Title (Title should be the same as a grant/proposal title, if funded by an external sponsor.)
   Massive Manipulation: An online user study on controlling large swarms of simple robots

2. Principal Investigator(s) (the Principal Investigator must be a Rice faculty member or equivalent) Complete **all** blocks for each Principal and Co-Investigator listed.

Principal Investigator

Name:	**James McLurkin**	Mail Stop:	**132**
Department:	**Computer Science**	E-mail:	**jmclurking@rice.edu**
Telephone:	**713-348-3049**		

Co-Investigator(s)

Name:	**Aaron Becker**	Mail Stop:	**132**
Department:	**Computer Science**	E-mail:	**ab55@rice.edu**
Telephone:	**217-722-2058**		

Co-Investigator(s)

Name:		Mail Stop:	
Department:		E-mail:	
Telephone:			

Co-Investigator(s)

Name:		Mail Stop:	
Department:		E-mail:	
Telephone:			

Co-Investigator(s)

Name:		Mail Stop:	
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Telephone:			

Co-Investigator(s)

Name:		Mail Stop:	
Department:		E-mail:	
Telephone:			

Co-Investigator(s)

Name:		Mail Stop:	
Department:		E-mail:	
Telephone:			

Note: This application MUST be submitted by the Principal Investigator, who assumes full responsibility for compliance with this protocol.

PRELIMINARY INFORMATION REQUIRED FOR IRB REVIEW DETERMINATION

SECTION 1: Is this a research activity using human subjects and thus requiring IRB review and approval? (see below)

Is the activity a systematic investigation of multiple human subjects, including research testing and evaluation? ☒ Yes ☐ No
Is the activity designed to test a hypothesis, permit conclusions to be drawn, and thereby to develop or contribute to generalizable knowledge? ☒ Yes ☐ No
Are all specimens/data collected from subjects who are known to be deceased? ☐ Yes ☒ No

SECTION 2: Exemption Categories [45 CFR 46.101(b)]

Exemption (b)(1) - Will the research be conducted in established or commonly accepted educational settings, involving normal education practices such as (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods? (This may include schools, colleges, and other sites where educational activities regularly occur) ☐ Yes ☒ No
Exemption (b)(2) - Will the research involve the use of educational tests, survey procedures, or observation of public behavior? ☒ Yes ☐ No *NOTE - research involving children is not eligible for this exemption. *If 'Yes', check all that apply*: ☒ Educational tests ☒ Surveys ☐ Interviews ☒ Observation of public behavior

Exemption (b)(3) - Will the research involve the use of educational tests, survey procedures, or observation of public behavior wherein the human subjects are elected or appointed public officials or candidates for public office; or (ii) federal statute(s) require(s) without exception that the confidentiality of the personally identifiable information be maintained throughout the research and thereafter? ☐ Yes ☒ No

Exemption (b)(4) - Does the research only involve the use or study of existing (already available or on the shelf) data, documents, records, or pathological or diagnostic specimens? ☐ Yes ☒ No If 'yes', check any items below that will be collected or studied. *(check all that apply)*

☐ Existing data ☐ Existing documents ☐ Existing records ☐ Existing pathological specimens
☐ Existing diagnostic specimens

Is this information publically available? ☐ Yes ☐ No

What is the source of the information or material? Include hyperlink, if known.

Provide the name and hyperlink for blood/tissue bank.

Will information be recorded in a manner that research participants cannot be identified, directly or through identifiers linked to the participants? ☐ Yes ☐ No

Exemption (b)(5) - Does the research evaluate or examine public benefit or service programs, such as demonstration or dissemination projects? ☐ Yes ☒ No

Exemption (b)(6) - Does the research involve taste and food quality evaluations? ☐ Yes ☒ No

If yes, what is the purpose of this study *(check all that apply)*?
☐ To evaluate the taste or quality of food ☐ To test consumer acceptance of a food

SECTION 3: Additional Information:

1. Expected Age Range of Participants: *(check all that apply* ☒ 18 and above ☒ minors under the age of 18

2. Will this study include embryonic stem cells? ☐ Yes ☒ No

3. Does this study include a diagnostic procedure that is medically indicated? ☐ Yes ☒ No

4. Does this study include disinfectant/sterilization procedure(s) used for study instrumentation? ☐ Yes ☒ No
If yes, please summarize procedures.

5. List any contrast agents to be applied to study subjects:

6. If this is a collaborative study, are any additional clinical procedures added to accommodate the Rice portion of the study? ☐ Yes ☒ No If yes, please explain:

7. List any instrumentation to be used that was built by Rice personnel:

8. Are you or will you be seeking FDA approval for a ☐ device, ☐ drug, or ☐ therapeutic?

9. Is this protocol being conducted under an Investigational Device Exemption (IDE)? ☐ Yes ☒ No

DETAILED INFORMATION REQUIRED FOR IRB REVIEW AND APPROVAL:

Please answer ALL questions below or indicate exemption under (b)(4). If a question does not apply to your study, please enter "N/A" in the appropriate box.

4. Study funding: Will this study be funded by an external sponsor? ☒ Yes ☐ No
If yes, please complete the information below.

Sponsoring agency(s): **NSF**
Grant Number (if already funded): **----**
Rice Fund Number (if already funded):

If Rice is a subcontractor to another entity, list the prime source of funding (e.g., NSF) if known.

5. Proposed Start Date (actual date may not precede IRB approval date) **July 2013**

6. Describe the purpose of the research. **Compare and contrast several control techniques for directing swarms of (simulated) robots**

7. Participant Recruitment: describe the source(s) of potential participants; how they will be selected and recruited; and how and how you will contact them. Describe all relevant characteristics of the participants with regard to age, ethnic background, gender, institutional status (i.e., patients or prisoners), and their general state of mental and physical health. **We will recruit colleagues, students and general internet users to complete a game-like simulation on the internet (http://swarmcontrol.herokuapp.com/).**

***or check here ☐ if this project qualifies for exemption under (b)(4).**

8. Describe procedures to be used and any associated risks or discomforts. **Procedures should be specific and listed step by step. The SwarmControl project aims to understand the best ways to control a swarm of robots by a human. The project achieves this through a community of game-developed experts. The project is continuously changed to promote the creation of experts and to become the most effective exploration tool. To achieve this, the project continuously gathers and analyzes data. Users interact by creating an account, playing the game, or using the website or associated communication channels.**
a) We are recording gameplay data for analysis and research. The game gathers and reports data generated by your activities in the game. If you create an account, this data will be associated with your account. If you play without an account or offline, data will be gathered anonymously by assigning you an anonymous identifier. If you log in with an account from a third party project, data will be associated with an identifier provided by that project and data may be reported to both SwarmControl and that project. Your IP address will not be recorded. Gameplay data such as robot configurations, scores, algorithms, tool and algorithm usage, progress, and time played may be logged and analyzed.
b) We may post surveys on the website. To better understand who plays the game, we may occasionally post research surveys on the website. These surveys will ask basic questions about topics such as motivation or demographic information, such as age, gender, and education level. Participation in these surveys is entirely voluntary.
c) Data used for research may be made public or shared with collaborators. Data and analysis may be shown in the game, on the website, and used in external publications, presentations, promotional materials, and other public venues. Data logged by the game may be shared with domain experts for analysis. We will contact you for permission before externally associating data analysis with your account name. However, your account name may appear without explicit permission in external demonstrations of the game or website, including presentations, videos, screenshots, and publications.
or check here ☐ if this project qualifies for exemption under (b)(4).

9. Describe **in detail** any safeguards to minimize risks or discomforts, including any measures to render the data anonymous **i.e., you will not know the identity of the research subject** or confidential **i.e., subjects' identity or**

personal identifying information will not be disclosed. Please be reminded that anonymity and confidentiality are not synonymous terms. **We will use an IP anonymizer. We will not know the identity of the research subject**

***or check here ☐ if this project qualifies for exemption under (b)(4).**

10. Describe any financial compensation or other potential benefits to the subjects associated with this research activity. If none, please indicate this in the box as "N/A". **N/A**

    ***or check here ☐ if this project qualifies for exemption under (b)(4).**

11. Does the proposed human subject research involve a financial or other interest of the PI or Co-PI?
    ☐ Yes ☒ No (see http://www.hhs.gov/ohrp/humansubjects/finreltn/fguid.pdf) If yes, please explain below.

12. Is the consent form attached? ☒ Yes ☐ No ☐ Waiver requested [please justify the need to waive this requirement or attach a separate document to the application.]

    ***or check here ☐ if this project qualifies for exemption under (b)(4).**

13. The IRB must review all materials to be seen or heard by the study participants. Are **all** materials (i.e., survey, interview questions, videos, etc.) referenced in the application form attached? ☐ Yes ☒ No
    If no, please explain.

    ***or check here ☐ if this project qualifies for exemption under (b)(4).**

14. Benefits and Risks: Please explain how the potential benefits to the subjects and/or the anticipated gain in research knowledge outweigh the risks to the subjects. (Be specific and succinct - do not simply "justify" the research.)

    ***or check here ☐ if this project qualifies for exemption under (b)(4).**

15. List all institution(s) involved in the proposed research (other than the funding source) that are recruiting participants, analyzing data, etc. Attach copies of their IRB approvals (including consent forms), as applicable. If copies are not attached, please explain. **N/A**

16. After reviewing Part 46 of the Code of Federal Regulations (http://www.hhs.gov/ohrp/humansubjects/guidance/45cfr46.htm), please check the appropriate box stating your judgment as to the required level of review for this study.

    ☐ Exempt from further IRB review ☒ Expedited ☐ Full Board review required

THIS SPACE FOR IRB USE

PROTOCOL NUMBER: **14-012E**

ACTIVITY TITLE: **Massive Manipulation: An online user study on controlling large swarms of simple robots**

APPROVAL DECISION:

☒ The protocol has been approved through expedited review in accordance with Title 45, Part 46, Section 46.110 of the Code of Federal Regulations. **(Category 7)**

☒ Without contingency(s) ☐With contingency(s) ☐ Contingency(s) met

John Cornwell

Digitally signed by John Cornwell
DN: cn=John Cornwell, o=Rice University, ou=IRB Chair, email=cornwell@rice.edu, c=US
Date: 2013.07.29 11:25:22 -05'00'

IRB Approving Signature: _____
Dr. John Cornwell – IRB Chair

Aaron + Becker

Consent Form for Participation in Research

Study Title: *SwarmControl*: An online user study on controlling large swarms of simple robots

Principal Investigator: Dr. **James McLurkin, Assistant Professor**
Computer Science, 3118 Duncan Hall,
6100 Main Street MS 132,
Houston, Texas 77005-1827
713-348-3049
jmclurkin@rice.edu

Other Investigator(s): Dr. Aaron Becker, Postdoctoral Research Associate; Chris Ertel

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Purpose of this Study
The purpose of the study is to compare and contrast several control techniques for directing swarms of simulated robots

Procedures
The *SwarmControl* project aims to understand the best ways to control a swarm of robots by a human. The project achieves this through a community of game-developed experts. The project is continuously changed to promote the creation of experts and to become the most effective exploration tool. To achieve this, the project continuously gathers and analyzes data. Users interact by creating an account, playing the game, or using the website or associated communication channels.

a) We are recording gameplay data for analysis and research. The game gathers and reports data generated by your activities in the game. If you create an account, this data will be associated with your account. If you play without an account or offline, data will be gathered anonymously by assigning you an anonymous identifier. If you log in with an account from a third party project, data will be associated with an identifier provided by that project and data may be reported to both SwarmControl and that project. Your IP address will not be recorded. Gameplay data such as robot configurations, scores, algorithms, tool and algorithm usage, progress, and time played may be logged and analyzed.

b) We may post surveys on the website. To better understand who plays the game, we may occasionally post research surveys on the website. These surveys will ask basic questions about topics such as motivation or demographic information, such as age, gender, and education level. Participation in these surveys is entirely voluntary.

c) Data used for research may be made public or shared with collaborators. Data and analysis may be shown in the game, on the website, and used in external publications, presentations, promotional materials, and other public venues. Data logged by the game may be shared with domain experts for analysis. We will contact you for permission before externally associating data analysis with your account name. However, your account name may appear without explicit permission in external demonstrations of the game or website, including presentations, videos, screenshots, and publications.

Consent Form for Participation in Research

The *SwarmControl* simulation is located at http://swarmcontrol.herokuapp.com/ Each game requires between 0.5 to 5 minutes to complete. Users are encouraged to play as many games as they want.

Participant Requirements
Sighted individuals who can read English, navigate a webpage, and use the arrow keys on a standard keyboard.

Risks
The risks and discomfort associated with participation in this study are no greater than those ordinarily encountered in daily life or during playing an online game such as Angry Birds (http://www.angrybirds.com/) or from typing on a computer keyboard.

Benefits
There may be no personal benefit from your participation in the study but the knowledge received may be of value to humanity.

Compensation & Costs
No compensation will be given. We may post account names on leaderboards to highlight the best times/scores.

There will be no cost to you if you participate in this study.

Confidentiality
By participating in the study, you understand and agree that Rice University may be required to disclose your consent form, data and other personally identifiable information as required by law, regulation, subpoena or court order. Otherwise, your confidentiality will be maintained in the following manner:

Your data and consent form will be kept separate. Your consent form will be stored in a locked location on Rice University property and will not be disclosed to third parties. By participating, you understand and agree that the data and information gathered during this study may be used by Rice University and published and/or disclosed by Rice University to others outside of Rice University. However, your name, address, contact information and other direct personal identifiers in your consent form will not be mentioned by Rice University in any such publication or dissemination of the research data and/or results.

The researchers will take the following steps to protect participants' identities during this study: (1) Each participant will be assigned a number; (2) The researchers will record any data collected during the study by number, not by name; (3) Any original recordings or data files will be stored in a secured location accessed only by authorized researchers.

Consent Form for Participation in Research

Rights

Your participation is voluntary. You are free to stop your participation at any point. Refusal to participate or withdrawal of your consent or discontinued participation in the study will not result in any penalty or loss of benefits or rights to which you might otherwise be entitled. The Principal Investigator may at his/her discretion remove you from the study for any of a number of reasons. In such an event, you will not suffer any penalty or loss of benefits or rights which you might otherwise be entitled.

Right to Ask Questions & Contact Information

If you have any questions about this study, you should feel free to ask them now. If you have questions later, desire additional information, or wish to withdraw your participation please contact the Principal Investigator by mail, phone or e-mail in accordance with the contact information listed on the first page of this consent.

Please contact us if you have any questions or concerns. We can be reached at swarmcontrol-feedback@rice.edu or at (713) 348-4539. If you have questions about your rights as a research participant, you may contact Vicki Colvin at Rice University. Email: vpr@rice.edu or Telephone: 713-348-2702. Please note that emails are considered insecure and privacy is not guaranteed.

Voluntary Consent

By signing below, you agree that the above information has been explained to you and all your current questions have been answered. You understand that you may ask questions about any aspect of this research study during the course of the study and in the future. By signing this form, you agree to participate in this research study.

PARTICIPANT SIGNATURE DATE

I certify that I have explained the nature and purpose of this research study to the above individual and I have discussed the potential benefits and possible risks of participation in the study. Any questions the individual has about this study have been answered and any future questions will be answered as they arise.

SIGNATURE OF PERSON OBTAINING CONSENT DATE

By signing below, you agree that the above information has been explained to you and all your current questions have been answered. You understand that you may ask questions about any aspect of this research study during the course of the study and in the future. By signing this form, you agree that your child may participate in this research study.

Consent Form for Participation in Research

PARENT SIGNATURE DATE

PRINT THE CHILD'S NAME

Minor's Assent
This research has been explained to me and I agree to participate.

MINOR'S SIGNATURE DATE

I certify that I have explained the nature and purpose of this research study to the above individual and I have discussed the potential benefits and possible risks of participation in the study. Any questions the individual has about this study have been answered and any future questions will be answered as they arise.

SIGNATURE OF PERSON OBTAINING CONSENT DATE

Online Consent form:
***SwarmControl* Terms of Service and Consent**
Version 1, 6/21/2013

If you are under 18, your parent or guardian must agree to these terms; please have your parent or guardian read, explain, and agree to the terms.

There is a simplified explanation at the bottom of this document.

The SwarmControl project aims to understand the best ways to control a swarm of robots by a human. The project achieves this through a community of game-developed experts. The project is continuously changed to promote the creation of experts and to become the most effective exploration tool. To achieve this, the project continuously gathers and analyzes data. By creating an account, playing the game, or using the website or associated communication channels, you acknowledge that:

a) We are recording gameplay data for analysis and research. The game gathers and reports data generated by your activities in the game. If you create an account, this data will be associated with your account. If you play without an account or offline, data will be gathered anonymously

Consent Form for Participation in Research

by assigning you an anonymous identifier. If you log in with an account from a third party project, data will be associated with an identifier provided by that project and data may be reported to both *SwarmControl* and that project. Your IP address will not be recorded. Gameplay data such as robot configurations, scores, algorithms, tool and algorithm usage, progress, and time played may be logged and analyzed.

b) We may post surveys on the website. To better understand who plays the game, we may occasionally post research surveys on the website. These surveys will ask basic questions about topics such as motivation or demographic information, such as age, gender, and education level. Participation in these surveys is entirely voluntary.

c) Data used for research may be made public or shared with collaborators. Data and analysis may be shown in the game, on the website, and used in external publications, presentations, promotional materials, and other public venues. Data logged by the game may be shared with domain experts for analysis. We will contact you for permission before externally associating data analysis with your account name. However, your account name may appear without explicit permission in external demonstrations of the game or website, including presentations, videos, screenshots, and publications.

d) The project may terminate, suspend, or block your account at any time.

e) Project members may contact you with your account email. When creating an account, you provide an email address. This email address may occasionally be used to contact you in relation to the game. You can opt out of this email contact at any time.

f) Scientific discoveries will be made publicly available and Rice University will handle ownership of discoveries. All significant scientific discoveries (such as structures, algorithms, etc.) made in game will be made publicly available. In the event that some discoveries may warrant patent protection, Rice University will handle the patent application process. US patent law will govern IP attribution for each discovery. Individual players who contributed to the discovery will be considered co-inventors for any discovery produced through play. Data logs of player activity will assist in determination of attribution.

g) You can opt out of further data gathering at any time. To do so, discontinue use of the game software, the website, chat, and other communication channels associated with the project.

h) This policy may change in the future. This policy may change at any time. You will be asked to agree to the new terms.

Here is a simplified explanation:

a) The game records how you play. We look at this for science and to make the game better.

b) We may ask you questions about yourself. You do not have to answer them.

c) We are sharing what we learn with others from all over the world. That is how science is done. We have to share so others can learn, too.

d) If you are not playing nicely, we can remove your account.

e) We may send you email about the project. You can ask us to not send you email.

f) Scientific things you find in the game will be made public. Rice University will help decide who owns them.

g) If you want us to stop gathering data from you, stop using the game and website.

h) We may change these rules. You will have a chance of agreeing to the new rules.

Consent Form for Participation in Research

Please contact us if you have any questions or concerns. We can be reached at swarmcontrol-feedback@rice.edu or at (713) 348-4539. If you have questions about your rights as a research participant, you may contact Vicki Colvin at Rice University. Email: vpr@rice.edu or Telephone: 713-348-2702. Please note that emails are considered insecure and privacy is not guaranteed.

By checking accept, you agree that you are 7 years of age or older, have read the above terms, and give your consent. If you are under 18, a parent or guardian has read the above terms, explained them to you, and agrees to give their consent

decline accept

RICE UNIVERSITY
Institutional Review Board
Approved Date: 07/26/2013
Expiration Date: 07/26/2014