

**LONDON’S GLOBAL UNIVERSITY**

**UCL Research Ethics Committee**

**Note to Applicants:** It is important for you to include all relevant information about your research in this application form as your ethical approval will be based on this form. Therefore anything not included will not be part of any ethical approval.

*You are advised to read the Guidance for Applicants when completing this form.*

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| **Application For Ethical Review: Low Risk** |

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| Are you applying for an urgent accelerated review? Yes  No  If yes, please state your reasons below. Note: Accelerated reviews are for exceptional circumstances only and need to be justified in detail. | |
| Is this application for a continuation of a research project that already has ethical approval? *For example, a preliminary/pilot study has been completed and is this an application for a follow-up project?* | Yes  No |
| **If yes,** provide brief details (see guidelines) including the title and ethics id number for the previous study: | |

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| **Section A: Application details** | | | |
| **1** | **Title of Project** | Hand Embodiment in Virtual Reality | |
| **2** | **Proposed data collection start date** | | 12/3/18 |
| **3** | **Proposed data collection end date** | | 30/3/19 |
| **4** | **Project Ethics Identification Number** | | 5998 007 |
| **5** | **Principal Investigator** | | Sebastian Friston |
| **6** | **Position held** (Staff/Student) | | Staff |
| **7** | **Faculty/Department** | | Computer Science |
| **8** | **Course Title***(if student)* | |  |
| **9** | **Contact Details**  Email:  Telephone: | | [sebastian.friston.12@ucl.ac.uk](mailto:sebastian.friston.12@ucl.ac.uk) +44 (0)203 5495 251 |
| **10** | **Provide details of other Co-Investigators/Partners/Collaborators who will work on the project.**  ***Note:*** *This includes those with access to the data such as transcribers.* | | |
| Name: ZHE WANG  Position held: STUDENT  Faculty/Department: COMPUTER SCIENCE  Location (UCL/overseas/other UK institution): UCL  Email: zczlzw1@ucl.ac.uk | | | Name:  Position held:  Faculty/Department:  Location (UCL/overseas/other UK institution):  Email: |
| If you **do not know** the names of all collaborators, please write their roles in the research. | | | |

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| **11** | **If the project is funded *(this includes non-monetary awards such as laboratory facilities)*** | |
| Name of Funder | | University College London |
| Is the funding confirmed? | | YES |

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| **12** | **Name of Sponsor** |
| The Sponsor is the organisation taking responsibility for the project, which will usually be UCL. If the Sponsor is not UCL, please state the name of the sponsor.  N/A | |

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| **13** | **If this is a student project** | |
| Supervisor Name | | Anthony Steed |
| Position held | | Professor |
| Faculty/Department | | Computer Science |
| Contact details | | a.steed@ucl.ac.uk |

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| **Section B: Project details** |

The following questions relate to the objectives, methods, methodology and location of the study. Please ensure that you answer each question in lay language.

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| **14** | **Provide a *brief* (300 words max) background to the project, including its intended aims.** |
| In psychology, a classic experiment is the “rubber hand illusion experiment”. The rubber hand illusion is a type of body transfer illusion, in which the body’s self-awareness can be transferred to an inanimate object. In this case, the hand. In the rubber hand illusion experiment, an association between the participants’ real hand and a fake hand is built, and the extent to which a participant believes that the fake hand is part of their body is measured through a stress response to a threat. This illusion has successfully been induced with immersive virtual reality (VR), and the use of virtual hands. Using motion tracked controllers, similar feelings of hand ownership to that of the rubber hand illusion can be induced. A key aspect to the efficacy of VR systems is to induce feelings of immersion with the user, by making the virtual environment seem real or believable. As the user’s body and environment are fully obscured from view when using head-mounted displays (HMDs), immersion is important to build a sense of engagement within the virtual environment. This body-ownership experiment could help to determine the impact of hand embodiment on making the VR experience more realistic. Based on previous research that examined the effects of the rubber hand illusion in VR, this project aims to determine how the appearance of virtual hand affects the rubber hand illusion. Thus, this project includes 3 different hand embodiments: a hand with an arm, a hand that will be hidden and substitute with stand-in object and an arrow hand. In within subject trials, the effect of each embodiment on the body transfer illusion will be evaluated. | |

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| **15** | **Methodology & Methods** (tick all that apply) | | |
| Interviews\*  Focus groups\*  Questionnaires (including oral questions)\*  Action Research  Observation  Documentary analysis (including use of personal records)  Audio/visual recordings (including photographs)  *\*Attach copies to application (see below).* | | | Collection/use of sensor or locational data  Controlled Trial  Intervention study (including changing environments)  Systematic review  Secondary data analysis – ***(See Section D)***  Advisory/consultation groups  Other, give details: |
| **16a** | | **Provide – in lay person’s language - an overview of the project;** focusing on your methodology and including information on what data/samples will be taken (including a description of the topics/questions to be asked), how data collection will occur and what (if relevant) participants will be asked to do. This should include a justification for the methods chosen. **(500 words max)**  Based on previous research that examined the effects of the rubber hand illusion in VR, this project aims to determine how the appearance of a users’ avatar affects the rubber hand illusion.  In VR, the user’s body and environment are fully obscured from view when using head-mounted displays (HMDs). Many VR experiences include a representation of the user’s body, known as an avatar, particularly if the experience requires a degree of interactivity.  Previous research has shown that the body transfer illusion is stronger when the user’s hand is represented as an arrow, or hidden when grasping objects, than when a static but realistic hand is used and remains visible. This is contrary to previous hypotheses. This project will continue this work by examining different conditions and hand appearance.  Before the experiment, participants will first be asked with the following questions to verbally verify their eligibility:  1. Have you consumed any alcohol within the past 6 hours?  2. Have you ever suffered an epileptic episode?  Answering Yes to either will disqualify the participant.  If eligible, they will then be asked to give verbal consent.  Once they have consented, an Oculus Rift HMD will be placed on their heads. Participants will find that they are in a supermarket aisle. This supermarket will be where participants carry out the remainder of the experiment. Participants will first complete a simple object grasping task with the Oculus Rift controllers. The VR system will highlight four objects in front of participants in a certain order, and participants will be asked to grasp the objects following that order. There will be 3 conditions, corresponding to the appearance of the virtual hands: (1) a hand that disappears when the user pick up an object, (2) a hand attached to a virtual arm, and a non-anthropomorphic arrow.  After completing the grasping task and growing accustomed to the mechanics of the hand, participants will sit in front of a supermarket checkout to pick up and scan objects that travel down a conveyer belt.  After a number of objects (15) have been checked out, a medium sized virtual lamp will fall onto the avatar’s hand to provoke a stress response.  Participants' stress responses will be measured by galvanic skin response, through a sensor placed on the figure, and a post-task questionnaire (Yuan and Steed, 2010). The strength of the responses will indicate the level of hand presence and body ownership transfer. Comparing the response strength under the different conditions will help elucidate what avatar characteristics affect the body ownership transfer of the hand in VR.  The entire experiment should take around 20 minutes per participant: a 5-minute induction, 3 minutes to adjust to the equipment, 3 minutes training (grasping task), 4 minutes on the check-out task, and 5 minutes debriefing and filling in the questionnaire.  The data recorded during the experiment will consist of the galvanic skin response sensor data, motion tracking data from controllers and the body ownership questionnaire. All data will be anonymous | |
| **16b** | | **Attachments**  If applicable, please attach a copy of any interview questions/workshop topic guides/questionnaires/test (such as psychometric), etc and state whether they are in final or draft form.  Drafts of the Information Sheet and Advert are attached. | |

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| **17** | **Please state which code of ethics (see Guidelines) will be adhered to for this research (for example, BERA, BPS, etc).** |
| RESPECT | |

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| **Location of Research** | |
| **18** | **Please indicate where this research is taking place.**  UK only (Skip to ‘location of fieldwork’)  Overseas only  UK & overseas |
| **19** | **If the research includes work outside the UK, is ethical approval in the host country (local ethical approval) required? *(See Guidelines.)***  Yes  No  **If no,** please explain why local ethical approval is not necessary.  **If yes,** provide details below including whether the ethical approval has been received.  **Note:** Full UCL ethical approval will not be granted until local ethical approval (if required) has been evidenced. |
| **20** | **If you (or any members of your research team) are travelling overseas in person are there any concerns based on governmental travel advice (**[***www.fco.gov.uk***](http://www.fco.gov.uk)***)*** **for the region of travel?** Yes  No  **Note:** C*heck* [*www.fco.gov.uk*](http://www.fco.gov.uk) *and submit a travel insurance form to UCL Finance (see application guidelines for more details). This can be accessed here:* <https://www.ucl.ac.uk/finance/secure/fin_acc/insurance.htm> (You will need your UCL login details.) |

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| **21** | **State the location(s) where the research will be conducted and data collected*.* For example public spaces, schools, private company, using online methods, postal mail or telephone communications.**  MPEB G01.A, 6.12 |
| **22** | **Does the research location require any additional permissions (e.g. obtaining access to schools, hospitals, private property, non-disclosure agreements, access to biodiversity permits (CBD), etc.)?**  Yes  No  **If yes,** please state the permissions required. |
| **23** | **Have the above approvals been obtained?**  Yes  No  **If yes,** please attach a copy of the approval correspondence.  **If not,** confirm they will be obtained prior to data collection. Yes  No |

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| **Section C: Details of Participants** |

In this form ‘participants’ means human participants and their data (including sensor/locational data, observational notes/images, tissue and blood samples, as well as DNA).

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| **24** | **Does the project involve the recruitment of participants?** |
| **Yes**  Complete all parts of this Section.  **No**  Move to Section D. | |

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| **Participant Details** | |
| **25** | Approximate maximum number of participants required: 60  Approximate upper age limit: None Lower age limit: 18  Justification for the age range and sample size: The sample size is typical for this type of study. We intend to recruit only consenting adults. |
| **Recruitment/Sampling** | |
| **26** | Describe how potential participants will be recruited into the study.  Participants will be recruited using adverts in participant pools. |
| **Informed Consent** | |
| **27a** | Describe the process you will use when seeking to obtain consent.  Participants will be fully briefed and asked the following questions orally:  1. Have you consumed any alcohol within the past 6 hours?  2. Have you ever suffered an epileptic episode?  3. Do you consent to participation in this experiment?  Answering Yes to questions 1 or 2 will disqualify the participant. Consent is considered obtained if, and only if, participants actively answer affirmatively to question 3. |
| **27b** | **Attachments** Please list them below:  Information Sheet  Participant Pool Advert |
| **27c** | If you are ***not*** intending to seek consent from participants, clarify why below:  N/A |

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| **28** | How will the results be disseminated (including communication of results with participants)?  The results will be used in a student’s individual project, and possibly in future papers at VR conferences on this subject |

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| **Section D: Accessing/Using Pre-collected Data** |

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| **Access to data** | |
| **29** | If you are using data or information held by third party, please explain how you will obtain this. You should confirm that the information has been obtained in accordance with the UK Data Protection Act 1998.  N/A |

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| **Accessing pre-collected data** | |
| **30** | **Does your study involve the use of previously collected data?**  **No** Move to Section E.  **Yes** Complete all parts of this Section. **Note:** If you ticked any boxes with an asterisk (\*),ensure further details are provided in Section E:Ethical Issues. |

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| **31** | **Name of dataset/s:** | |
| **32** | **Owner of dataset/s (if applicable):** | |
| **33** | **Is the data in the public domain?** Yes  No  **If not,** do you have the owner’s permission/license? Yes  No\* | |
| **33** | **Is the data anonymised?** Yes  No  **If not:**   1. Do you plan to anonymise the data? Yes  No\* 2. Do you plan to use individual level data? Yes\*  No 3. Will you be linking data to individuals? Yes\*  No | |
| **34** | Is the data sensitive ([DPA 1998 definition](http://www.legislation.gov.uk/ukpga/1998/29/section/2))? | Yes\*  No |
| **35** | Will you be conducting analysis within the remit it was originally collected for? | Yes  No\* |
| **36** | If not, was consent gained from participants for subsequent/future analysis? | Yes  No\* |

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| **Section E: Ethical Issues** |

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| **Ethical Issues** | |
| **37** | Please address clearly any ethical issues that may arise in the course of this research and how they will be addressed. Further information and advice can be found in the guidelines.  VR has the potential to cause simulator sickness. Participants will be informed of this risk before the experiment, and they will be told to inform the experimentor immediately if they feel unwell during the experiment, at which point the experiment will be terminated immediately.  Participants will not be informed of the entire protocol. Specifically, they will not be aware of the event intended to provoke a stress response, as to do so may influence their behaviour, but afterwards will have all conditions and methodologies explained to them fully. |

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| **Risks & Benefits** | |
| **38** | Please state any *benefits* to participants in taking part in the study (this includes feedback, access to services or incentives),  There are no benefits to participants in this study other than compensation and the ability to try a novel VR experience |
| **39** | Do you intend to offer incentives or compensation, including access to free services)?  Yes  No  **If yes,** specify the amount to be paid and/or service to be offered **as well as a justification for this**.  Participants will be paid £5 for their time and travel expenses. |
| **40** | Please state any *risks* to participants and how these risks will be managed.  Participants may experience simulator sickness while using VR, we will ask participants to have a rest, or stop the experiment if they do not want to continue. |
| **41** | Please state any *risks* to you or your research team and how these risks will be managed.  There are no risks to the researchers. |

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| **Section F: Data Storage & Security** |

Please ensure that you answer each question and include all hard and electronic data.

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| **42** | **Will the research involve the collection and/or use of personal data?**  Yes  No  ***Personal data*** *is data which relates to a living individual who can be identified from that data OR from the data and other information that is either currently held, or will be held by the data controller (the researcher).*  *This includes:*   * *any expression of opinion about the individual and any intentions of the data controller or any other person toward the individual.* * *sensor, location or visual data which may reveal information that enables the identification of a face, address, etc (some postcodes cover only one property).* * *combinations of data which may reveal identifiable data, such as names, email/postal addresses, date of birth, ethnicity, descriptions of health diagnosis or conditions, computer IP address (if relating to a device with a single user).*   If you do not have a registration number from Legal Services, please clarify why not:  No personal or personally identifiable data will be collected in this experiment. |
| **43** | **Is the research collecting or using**   * sensitive personal data as defined by the UK Data Protection Act (racial or ethnic origin / political opinions / religious beliefs / trade union membership / physical or mental health / sexual life / commission of offences or alleged offences), and/or * data which might be considered sensitive in some countries, cultures or contexts.   **If yes,** state whether explicit consent will be sought for its use and what data management measures are in place to adequate manage and protect the data.  N/A |

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| **44** | **All research projects using personal data must be registered with Legal Services before the data is collected, please provide the Data Protection Registration Number:**  If you do not have a registration number from Legal Services, please clarify why not:  No personally identifiable information is collected so the data does not fall under the GDPR. |

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| **During the project** *(including the write up and dissemination period)* | |
| **45** | **State what types of data will be generated from this project** (i.e. transcripts, videos, photos, audio tapes, field notes, etc).  Anonymized log files of motion tracking data from controllers and stress level data from a galvanic skin response sensor.  **How will data be stored, including where and for how long?** This includes all hard copy and electronic data on laptops, share drives, usb/mobile devices.  Anonymised log files will be stored on a cloud storage platform indefinitely.  **Who will have access to the data, including advisory groups and during transcription?**  Anonymised log files will be accessible only to the investigators. |
| **46** | **Do you confirm that all personal data will be stored and processed in compliance with the Data Protection Act 1998 (DPA 1998).**  Yes  No  **If not,** please clarify why.  N/A |
| **47** | **Will personal data be processed or be sent outside of the European Economic Area (EEA)?\***  Yes  No  **If yes,** please confirm that there are adequate levels of protection in compliance with the DPA 1998 and state what the arrangements are below.  **\*Please note** that if you store your research data containing identifiable data on UCL systems or equipment (including by using your UCL email account to transfer data), or otherwise carry out work on your research in the UK, the processing will take place within the EEA and will be captured by Data Protection legislation. |

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| **After the project** | |
| **48** | **What data will be stored and how will you keep it secure?**  Anonymised log files will be stored. They will be secured by the storage medium’s access controls.  **Where will the data be stored and who will have access?**  Anonymised log files will be stored on a cloud storage platform indefinitely. Only the principal researcher will have access.  **Will the data be securely deleted?**  Yes  No  **If yes,** please state when this will occur: |
| **49** | **Will the data be archived for use by other researchers?** Yes  No  **If yes,** please provide further details including whether researchers outside the European Economic Area will be given access.  Anonymised log files may be provided to any researcher who makes a request in writing. |

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| **Section G: Declaration**  **I confirm that the information in this form is accurate to the best of my knowledge.** | |
| Signature |  |
| Date |  |
| ***If student:***  **I have met with and advised the student on the ethical aspects of this project design.**  Supervisor Name: | |
| Supervisor Signature: |  |
| Date: |  |

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| **Signature of Head of Department (or Chair of the Departmental Ethics Committee)** | |
| **Part A**  I have read the ‘criteria of minimal risk’ as defined on page 3 of the Guidelines (<http://ethics.grad.ucl.ac.uk/forms/guidelines.pdf>) and I recommend that this application be considered by the Chair of the UCL REC.  Yes  No | |
| **Part B**  **I have discussed this project with the principal researcher who is suitably qualified to carry out this research and I approve it. I am satisfied that\*\* (highlight as appropriate):**   1. **Data Protection registration:**  * has been satisfactorily completed * has been initiated * is not required  1. **A risk assessment:**  * has been satisfactorily completed * has been initiated  1. **Appropriate insurance arrangements are in place and appropriate sponsorship [funding] has been approved and is in place to complete the study.**   Yes  No   1. **A Disclosure and Barring Service check(s):**  * has been satisfactorily completed * has been initiated * is not required   **Note:** Links to details of UCL's policies on the above can be found at: <http://ethics.grad.ucl.ac.uk/procedures.php>  **\*\*If any of the above checks are not required please clarify why below.** | |
| Name: |  |
| Signature: |  |
| Date: |  |

Updated 19.10.2017