

Application Form for Physical Sciences Ethics Committee Approval***Advice for applicants on completing the form***

Please ensure that the information provided is:

- *Accurate and concise*
- *Clear and simple and easily understood by a lay person*
- *Free of jargon, technical terms and abbreviations*

Further advice and information can be obtained from your departmental representative on the PSEC and at: <http://www.york.ac.uk/admin/aso/ethics/cttee.htm>

Please return completed (typed) form to your departmental representative via email to:

elec-ethics@york.ac.uk

Title of project: Measurement of Resolution Thresholds of Parameters of Binaural Room Impulse Responses on Perceptual Reverberation

SECTION 1 DETAILS OF APPLICANTS**Details of principal investigator (name, appointment and qualifications)**

Gavin Kearney, PhD, Associate Professor in Audio and Music Technology.

Names, appointments and qualifications of additional investigators *(student applicants should include their project supervisor(s) here)*

Huan Mi, PhD student in Audio and Music Technology, project supervisors: Gavin Kearney and Helena Daffern

Location(s) of project

Project located at: University of York Audio Lab, Genesis 6, Science Park

Experiments will be undertaken in people's homes.

SECTION 2 FUNDERS**What is the funding source(s) for the project?**

This project is proposed by a self-funding PhD student, no external funding provided.

Please answer the following:

- (i) Does the express and direct aim of the research or other activity raise ethical issues?

YES ☐

NO ☒

- (ii) Is there any obvious or inevitable adaptation of research findings to ethically questionable aims?

YES ☐

NO ☒

- (iii) Is the work being funded by organisations tainted by ethically questionable activities?

YES ☐

NO ☒

- (iv) Are there any restrictions on academic freedoms – notably, to adapt and withdraw from ongoing research, and to publish findings?

YES ☐

NO ☒

If you answered **Yes** to any of the above, please give details below:

SECTION 3 DETAILS OF PROJECT OR OTHER ACTIVITY**Aims (100 words max)**

The project aims to analyse the effect of parameters of binaural room impulse responses on perceptual reverberation and detect their resolution thresholds. It is devised for headphone listening. The project aims to test these resolution thresholds with 20 subjects with a listening test application that will be deployed online.

Background (250 words max)

The parameters of RIRs are the basic elements affecting the perceptual reverberation. Therefore, the purpose of this research is to explore the impact thresholds of parameters of RIRs on perceptual reverberation, which is the basic research of artificial reverberation algorithm.

The proposers have developed a listening test to confirm the impact thresholds of parameters of RIRs on perceptual reverberation by changing parameters of BRIRs, such as extending initial time delay gap (ITDG), remove early reflections (ERs) forward or reversely, or remove late reverberation (LR), and then convolved these altered BRIRs with a dry speech signal to generate reverberation audio samples. Participants are asked to compare the altered reverberation audio samples and the original reverberation audio samples with staircase method to obtain individual perceived thresholds. The average impact threshold of each parameter on perceptual reverberation was calculated by individual thresholds of these twenty participants.

Brief outline of project/activity (250 words max)

Due to Covid-19 restrictions, this experiment will be conducted remotely in participant's homes.

Consent will be gained using the University's Consent form v1.2.

Participants will be given the information sheet and a download link to a bespoke Matlab application (app) – if they agree, they can download the Matlab application, if not, they do not have to continue. Participants will be only allowed to complete the tasks in the following order.

First participants need to review the information sheet and the consent form – if they agree and sign them, they need to review the installation and operation instruction and download the app, if not, they can give up the test. Participants will be only allowed to complete the tasks in the following order.

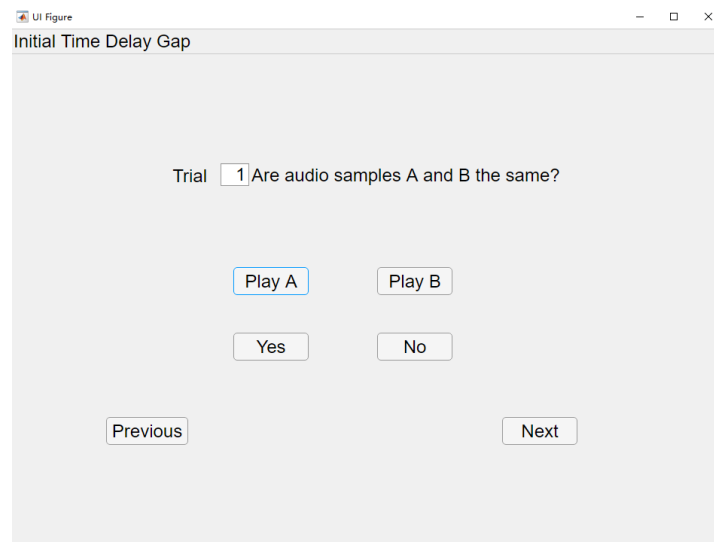
The installation and operation instruction will be provided to guide participants to install and run the listening test.

They will input their unique identifier and begin the test. Whenever they want to terminate the test, they can, and they do not need to provide any reason and completed results.

Participants then should set a safe and comfortable headphone listening level.

There are 12 parts totally. In each part, there are a reference audio and many test audios (less than 30 to reduce fatigue) which are generated by convolving dry sound with BRIRs that are changed parameters, including reversely removed early reflections, extended ITDG, forward removed early reflections and removed late reverberation. In each part, participants will identify whether there is difference between the audios and the reference audio until the part finish.

A graphical interface (below) allows participants, using the button 'Play A' and 'Play B' to play the reference audio and the test audio, and 'Yes' and 'No' to response.



Participants must take a 30 second break after each part. They can also take an extra break at any time.

The test will be approximately 60 minutes dependent on participant reaction times.

Participants will then email the results file back, upon which they will receive remuneration for the test.

If the study involves participants, how many will be recruited?

Approximately 20 people. Participants will mostly be AudioLab team members. Other participants will be recruited via the department mailing lists for postgraduate and undergraduate groups.

If applicable, what is the statistical power of the study, i.e. what is the justification for the number of participants needed?

The participants are all experienced listeners. They have more professional knowledge and testing experience, so the error of perceptual difference between the processed and non-processed reverberation could be small. As such 20 participants or more will be required to show statistical significance.

SECTION 4 RECRUITMENT OF PARTICIPANTS

How will the participants be recruited?

Primarily people from the Audio Lab, students/lecturers recruited through emails sent throughout the department, and personal contacts.

What are the inclusion/exclusion criteria?

Exclusion:
People who:

1. have hearing, vision or movement disabilities.
2. are not comfortable with audio noise.

Will participants be paid reimbursement of expenses?

YES ☐

NO ☒

Will participants be paid?

YES ☒

NO ☐

If yes, please obtain signed agreement

Will any of the participants be students?

YES ☒

NO ☐

SECTION 5 DATA STORAGE AND TRANSMISSION

If the research will involve storing personal data, including sensitive data, on any of the following please indicate so and provide further details (answers only required if *personal* data is to be stored).

Manual files	<input checked="" type="checkbox"/>
University computers	<input checked="" type="checkbox"/>
Home or other personal computers	<input checked="" type="checkbox"/>
Laptop computers, tablets	<input checked="" type="checkbox"/>
Website	<input checked="" type="checkbox"/>

Please explain the measures in place to ensure data confidentiality, including whether encryption or other methods of anonymisation will be used.

Computers will be password protected. Stored participant data will be anonymised. No paper documentation will exist for this study. Data will be stored in encrypted files/folders.

Please detail who will have access to the data generated by the study.

Investigators only

Please detail who will have control of and act as custodian for, data generated by the study.

Investigators only

Please explain where, and by whom, data will be analysed.

By the investigators at the University of York Audio Lab and at the investigator's homes.

Please give details of data storage arrangements, including where data will be stored, how long for, and in what form.

Data will be stored on investigators' personal computers and at the University of York

Audio lab storage in encrypted files. Data will only be stored on the investigators' PCs until the end of the 2022 academic year.

SECTION 6 CONSENT

Is written consent to be obtained?

YES ☒

NO ☐

If yes, please attach a copy of the information for participants

If no, please justify

Will any of the participants be from one of the following vulnerable groups?

Children under 18

YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>
-----	--------------------------	----	-------------------------------------

People with learning difficulties

YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>
-----	--------------------------	----	-------------------------------------

People who are unconscious or severely ill

YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>
-----	--------------------------	----	-------------------------------------

People with mental illness

YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>
-----	--------------------------	----	-------------------------------------

NHS patients

YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>
-----	--------------------------	----	-------------------------------------

Other vulnerable groups (if 'yes', please give details)

YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>
-----	--------------------------	----	-------------------------------------

If so, what special arrangements have been made for getting consent?

--

SECTION 7 DETAILS OF INTERVENTIONS

Indicate whether the study involves procedures which:

Involve taking bodily samples

YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>
-----	--------------------------	----	-------------------------------------

Are physically invasive

YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>
-----	--------------------------	----	-------------------------------------

Are designed to be challenging/disturbing (physically or psychologically)

YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>
-----	--------------------------	----	-------------------------------------

If so, please list those procedures to which participants will be exposed:

List any potential hazards:

The audio signal bursts last for 4 seconds. During this time, the participant will not hear external sounds. However, the test instructions stipulate that the subject should be seated in a quiet, non-distracting environment. The risk of any external factor causing injury due to the participant not being able to hear it during the test is extremely low. The participant will also be guided through the process of setting a comfortable and safe listening level for the experiment.

List any discomfort or distress:

None.

What steps will be taken to safeguard

- (i) the confidentiality of information

Data will be saved in password protected devices. Files will be encrypted. Only a small amount of personal data is obtained, which will be stored in accordance with GDPR requirements using the University of York's computers or personal laptop. All data will be stored anonymously, but retrieved and deleted for a particular individual if requested.

- (ii) the specimens themselves?

Participants are instructed to stop the test immediately if they show any signs of significant discomfort or distress. Participants can also withdraw from the test at any time.

What particular ethical problems or considerations are raised by the proposed study?

None

What do you anticipate will be the output from the study? *Tick those that apply:*

Peer-reviewed publications
 Non-peer-reviewed publications
 Reports for sponsor
 Confidential reports
 Presentation at meetings
 Press releases
 Student project

√
√
√
√
√

Is there a secrecy clause to the research?

If yes, please give details below

YES	
-----	--

NO	✓
----	---

SECTION 8 SIGNATURES

The information in this form is accurate to best of my knowledge and belief and I take full responsibility for it.

I agree to advise of any adverse or unexpected events that may occur during this project, to seek approval for any significant protocol amendments and to provide interim and final reports. I also agree to advise the Ethics Committee if the study is withdrawn or not completed.

Signature of Investigator(s):



.....

.....

Date:

14th October 2020.....

Responsibilities of the Principal Researcher following approval

- If changes to procedures are proposed, please notify the Ethics Committee
- Report promptly any adverse events involving risk to participants