***Faculty of Science and Technology Research Ethics Committee (FSTREC)***

***Lancaster University***

***Application for Ethical Approval for Research***

**This form should be used for all projects by staff and research students, whether funded or not, which have not been reviewed by any external research ethics committee.** If your project is or has been reviewed by another committee (e.g. from another University), please contact the [FST research ethics officer](mailto:fst-ethics@lancaster.ac.uk) for further guidance.

In addition to the completed form, you need to submit **research materials** such as:

1. Participant information sheets
2. Consent forms
3. Debriefing sheets
4. Advertising materials (posters, e-mails)
5. Letters/emails of invitation to participate
6. Questionnaires, surveys, demographic sheets that are non-standard
7. Interview schedules, interview question guides, focus group scripts

Please note that **you DO NOT need to submit pre-existing questionnaires or standardized tests** that support your work, but which cannot be amended following ethical review. These should simply be referred to in your application form.

**Please submit this form and any relevant materials by email as** a **SINGLE attachment** to [*fst-ethics@lancaster.ac.uk*](mailto:fst-ethics@lancaster.ac.uk)

**Section One**

***Applicant and Project Information***

# Name of Researcher: Muhammad Umair

***Project Title: Synch with me: A mobile app to achieve breathing synchrony***

# Level: PhD

# Supervisor (if applicable): Dr. Corina Sas

# Researcher’s Email address: m.umair7@lancaster.ac.uk

# Telephone: 07477921206

# Address: School of Computing and Communications

# Names and appointments/position of all further members of the research team:

# Is this research externally funded? If yes,

# ACP ID number: AffecTech ITN

# Funding source: EC

# Grant code:

# Does your research project involve any of the following?

Human participants (including all types of interviews, questionnaires, focus groups, records relating to humans, use of internet or other secondary data, observation etc.)

Animals - the term animals shall be taken to include any non-human vertebrates or cephalopods.

Risk to members of the research team e.g. lone working, travel to areas where researchers may be at risk, risk of emotional distress

Human cells or tissues other than those established in laboratory cultures

Risk to the environment

Conflict of interest

Research or a funding source that could be considered controversial

Social media and/or data from internet sources that could be considered private

Any other ethical considerations

**Yes – complete the rest of this form**

**No – your project does not require ethical review or submission of this form**

**Section Two**

***Type of study***

Includes *direct* involvement by human subjects. ***Complete all sections apart from Section 3.***

Involves *existing documents/data only*, or the evaluation of an existing project with no direct contact with human participants*.* ***Complete all sections apart from Section 4.***

**If your research involves data from chat rooms and similar online spaces where privacy and anonymity are contentious, please complete all sections**

# Project Details

**1. Anticipated project dates (month and year)**

**Start date:**  January 2019  **End date:** December 2019

**2. Please briefly describe the background to the research (no more than 150 words, in lay-person’s language):**

The project “*Synch with me: A mobile app to achieve breathing synchrony”* explores interpersonal synchrony: the synchronization dynamics between physiological activities of two or more individuals. Interpersonal physiological synchrony is often expressed through multiple modalities such as body movements, breathing patterns, skin conductance, heart rate and pupil dilation etc. Existing work explored interpersonal synchrony in various contexts and linked it to several relational features such fostering empathy, attachment security, closeness, trust, cooperation and mutual affect regulation [1-6]. Although, humans have natural tendency to become physiologically synchronize with each other [7], the physiological signals are not directly observable and need additional layer in order to become better perceivable. This project explores biofeedback as an intermediate layer to support interpersonal synchrony by providing feedback on breathing patterns. The choice of breathing rate over other physiological measures is because controlling breathing requires significantly less effort in comparison to other physiological measures for example heart rate variability, skin conductance or brain signals (EEG).

References:

1. Marci, C.D., Ham, J., Moran, E. and Orr, S.P., 2007. Physiologic correlates of perceived therapist empathy and social-emotional process during psychotherapy. *The Journal of nervous and mental disease*, *195*(2), pp.103-111.
2. Diamond, L.M., Hicks, A.M. and Otter-Henderson, K.D., 2008. Every time you go away: Changes in affect, behavior, and physiology associated with travel-related separations from romantic partners. *Journal of Personality and Social Psychology*, *95*(2), p.385.
3. Wiltermuth, S.S. and Heath, C., 2009. Synchrony and cooperation. *Psychological science*, *20*(1), pp.1-5.
4. Reddish, P., Fischer, R., & Bulbulia, J. (2013). Let’s Dance Together: Synchrony, Shared Intentionality and Cooperation. PloS one.
5. Butler, E.A. and Randall, A.K., 2013. Emotional coregulation in close relationships. *Emotion Review*, *5*(2), pp.202-210.
6. Field, T., 2012. Relationships as regulators. *Psychology*, *3*(6), pp.467-479.
7. Palumbo, R.V., 2015. Interpersonal physiology: Assessing interpersonal relationships through physiology.

**3. Please state the aims and objectives of the project (no more than 150 words, in lay-person’s language):**

This project aims to study and document the effects of achieving breathing synchrony between two people. It does so by developing a mobile application which provides feedback on breathing patterns. We want to highlight that we are not measuring trust or closeness but using this workshop as an opportunity to gain feedback and possible improvements around this technology.

**4. Methodology and Analysis:**

We are developing a mobile application, which collects data from breathing sensor and then displays the breathing data in the form of a breathing (going in, going out) display. The mobile application can display breathing patterns of two people simultaneously. We want to conduct a user study where two users will be given breathing sensors and access to a biofeedback mobile application. Users will be required wear the provided breathing sensors individually and follow each other’s breathing patterns to achieve synchrony. The application will collect and use breathing data from both users to alter its display and track progress through the activity. Users will be asked to complete 15-20 mins in-lab breathing sessions and will also be asked to take the sensors and the mobile application with them for using it in daily life settings. They will be required to complete 15-20 minute activity at a maximum of twice each weekday while they’re apart from one another, this will last over the course of 3 days. We want to highlight that users will not be paired by us but participants will be allowed to bring their friends and family. After this stage has concluded, interviews will be held with people to gather their feedback. The interviews will be audio recorded and then transcribed for later analysis. Once the study is complete the data collected from the user studies will be analysed to find any correlations between the completion of the application activity and a gradual sync of the breathing of the participants. The results of the analysis will then be evaluated and with a discussion on the larger scale potential of the study’s results will also be drawn.

**Section Three**

***Secondary Data Analysis***

**Complete this section if your project involves *existing documents/data* *only*, or the evaluation of an existing project with no direct contact with human participants**

1. Please describe briefly the data or records to be studied, or the evaluation to be undertaken.

2. How will any data or records be obtained?

3. Confidentiality and Anonymity: If your study involves re-analysis and potential publication of existing data but which was gathered as part of a previous project involving direct contact with human beings, how will you ensure that your re-analysis of this data maintains confidentiality and anonymity as guaranteed in the original study?

4. What plan is in place for the storage of data (electronic, digital, paper, etc)? Please ensure that your plans comply with the Data Protection Act 1998.

5. What are the plans for dissemination of findings from the research?

6a. Is the secondary data you will be using in the public domain? YES/NO

6b. If NO, please indicate the original purpose for which the data was collected, and comment on whether consent was gathered for additional later use of the data.

7. What other ethical considerations (if any), not previously noted on this application, do you think there are in the proposed study? How will these issues be addressed?

8a. Will you be gathering data from discussion forums, on-line ‘chat-rooms’ and similar online spaces where privacy and anonymity are contentious? YES/NO

If yes, your project requires full ethics review. Please complete all sections.

**Section Four**

# Participant Information

**Complete this section if your project** **includes *direct* involvement by human subjects.**

1. Please describe briefly the **intended human participants** (including number, age, gender, and any other relevant characteristics):

* Number of Participants: 18 participants; (9 Pairs); Participants will be recruited in pairs;
* Age: 20-50 Years
* Gender: Males, Females (Mixed)
* Exclusion criteria: We will only recruit participants with no breathing difficulties or chronic breathing problems.

2. How will participants be **recruited** and from where?

* SCC- mailing list
* Posters along the spine

3. Briefly describe your **data collection methods**, drawing particular attention to any potential ethical issues.

* Mobile Application and Semi structured interviews
* Ethical Issues: Participants audio and video will be recorded and saved on a Lancaster University desktop hard disk. The data will be anonymized and not made public, and participants will not be identified from their audio recordings. The audio will be destroyed after the project is completed, but the transcripts (which will be done by researchers themselves) will be saved securely.   
  Photos and videos will be taken of the participants while using the application, however these images and video will be taken in a way that anonymizes the participants. As well as this the video, audio and textual data will be recorded before and after the session, but this data will also be anonymized. All of the data collected during the session will be stored securely and only be used by the researchers involved. We will also make sure that any data obtained from sensors will be anonymized and not made public.   
    
  On how the data will be anonymized:
  + Transcripts – In any transcripts taken participants will be referred to anonymously and not by their name
  + Images – Images taken will not include face or any distinctive clothing, and if it arises than an image does these features will be blurred out
  + Video – In the video taken again a blur effect will be applied to the face and any identifiable clothing or features.
  + Sensor Data – Sensor data will be referred anonymously and not by participants name.

**4. Consent**

4a. Will you take all necessary steps to **obtain the voluntary and informed consent** of the prospective participant(s) or, in the case of individual(s) not capable of giving informed consent, the permission of a legally authorised representative in accordance with applicable law? **YES**

If yes, please go to question 4b. If no, please go to question 4c.

4b. Please explain the procedure you will use for **obtaining consent**? If applicable, please explain the procedures you intend to use to gain permission on behalf of participants who are unable to give informed consent.

* All participants will be given participant information sheet with details about the study and its procedure. If participants agree with the details provided, they will sign the given consent form.

4c. If it will be necessary for participants to take part in the study **without their knowledge and consent at the time**, please explain why (for example covert observations may be necessary in some settings; some experiments require use of deception or partial deception – not telling participants everything about the experiment).

* N.A

5. Could participation cause **discomfort** (physical and psychological e.g. distressing, sensitive or embarrassing topics), **inconvenience or danger beyond the risks encountered in normal life**? Please indicate plans to address these potential risks. State the timescales within which participants may withdraw from the study, noting your reasons.

* N.A

6. How will you protect participants’ **confidentiality and/or anonymity** in data collection (e.g. interviews), data storage, data analysis, presentation of findings and publications?

* The study’s results will be published in a scientific conference/Journal paper and will be used in a PhD thesis. All data will be anonymized and will be saved securely.

Data will be anonymized by:

* Referring to participants anonymously, not by name in the transcript and in Paper.
* Taking photos/video in a way that obscure the face and any identifiable features/clothing, or if they are present in a photo then blurring them out.

7. Do you anticipate any ethical constraints relating to **power imbalances or dependent relationships**, either with participants or with or within the research team? If yes, please explain how you intend to address these?

* N.A

8. What potential **risks may exist for the researcher** and/or research team? Please indicate plans to address such risks (for example, noting the support available to you/the researcher; counselling considerations arising from the sensitive or distressing nature of the research/topic; details of the lone worker plan you or any researchers will follow, in particular when working abroad.

* N.A

9. Whilst there may not be any significant direct **benefits to participants** as a result of this research, please state here any that may result from participation in the study.

* The study has the potential to help the participants feel more connected, have more trust and closeness by providing feedback on their breathing.

10. Please explain the **rationale for any incentives/payments** (including out-of-pocket expenses) made to participants:

* As participants will be taking part in the lab study and outside lab activity over 3 days, there will have to be an incentive to encourage continuous participation. Each participant will be given £8 for their contribution to the study in the form of amazon voucher. The emails will be collected when participants sign the consent form and therefore will be destroyed after participants are paid. Emails will never be linked to research data.

11. What are your plans for the **storage of data** (electronic, digital, paper, etc.)? Please ensure that your plans comply with the Data Protection Act 1998.

* All textual data will be saved for 10 years.
* Audio recordings will be destroyed once the project is finished.
* Textual and Audio data will be encrypted and saved on Lancaster University Desktop.
* Textual data will also be encrypted on researcher’s laptops during the duration of study.
* Video/Images will be encrypted and stored on a Lancaster University Desktop for 10 years succeeding the study.
* Data obtained from sensors will also be anonymized, encrypted and saved on Lancaster University Desktop.

12. Please answer the following question *only* if you have not completed a Data Management Plan for an external funder.

12.a How will you make your data available under open access requirements?

* All participants data collected during the study will be anonymised, analysed, evaluated and made available for research purposes.

12b. Are there any restrictions on sharing your data for open access purposes?

* Any recordings will be used solely by the projects participants and will not be made available to external parties.

13. Will **audio or video recording** take place?  no  audio  video

13a. Please confirm that portable devices (laptop, USB drive etc.) will be **encrypted** where they are used for identifiable data. If it is not possible to encrypt your portable devices, please comment on the steps you will take to protect the data.

* Any portable devices used to collect identifiable data will be encrypted.

13b. What arrangements have been made for **audio/video data storage**? At what point in the research will tapes/digital recordings/files be destroyed?

* All the audio recordings will be encrypted and saved on secure Lancaster University hard drives.
* The audio recordings will only be accessed by the projects researchers and will be destroyed once they are transcribed.
* All textual data gathered from the sensors and audio transcriptions and videos will be kept for 10 years on secure Lancaster University servers.

13c. If your study includes video recordings, what are the implications for participants’ anonymity? Can anonymity be guaranteed and if so, how? If participants are identifiable on the recordings, how will you explain to them what you will do with the recordings? How will you seek consent from them?

* Any faces present in video footage will be blurred as well as any identifiable aspects of the participants clothing.

14. What are the plans for dissemination of findings from the research? If you are a student, mention here your thesis. Please also include any impact activities and potential ethical issues these may raise.

* Study findings will be used for a PhD thesis and is intended to be published in a Conference/Journal.

15. What particular ethical considerations, not previously noted on this application, do you think there are in the proposed study? Are there any matters about which you wish to seek guidance from the FSTREC?

* N.A

**Section Five**

***Additional information required by the university insurers***

If the research involves either the nuclear industry or an aircraft or the aircraft industry (other than for transport), please provide details below:

**Section Six**

***Declaration and Signatures***

I understand that as Principal Investigator/researcher/PhD candidate I have overall responsibility for the ethical management of the project and confirm the following:

* I have read the Code of Practice, [Research Ethics at Lancaster: a code of practice](http://www.lancaster.ac.uk/depts/research/documents/New%20ethics%20docs/Ethics-code-of-practice%20Senate.pdf) and I am willing to abide by it in relation to the current proposal.
* I will manage the project in an ethically appropriate manner according to: (a) the subject matter involved and (b) the Code of Practice and Procedures of the University.
* On behalf of the University I accept responsibility for the project in relation to promoting good research practice and the prevention of misconduct (including plagiarism and fabrication or misrepresentation of results).
* On behalf of the University I accept responsibility for the project in relation to the observance of the rules for the exploitation of intellectual property.
* If applicable, I will give all staff and students involved in the project guidance on the good practice and ethical standards expected in the project in accordance with the University Code of Practice. (Online Research Integrity training is available for staff and students [here](https://modules.lancs.ac.uk/course/view.php?id=7687).)
* If applicable, I will take steps to ensure that no students or staff involved in the project will be exposed to inappropriate situations.
* I confirm that I have completed all risk assessments and other Health and Safety requirements as advised by my departmental Safety Officer.

Confirmed

**Please note:** If you are not able to confirm the statement above please contact the FST Research Ethics Committee and provide an explanation.

**Student applicants:**

Please tick to confirm that you have discussed this application with your supervisor, and that they agree to the application being submitted for ethical review

***Students must submit this application from your Lancaster University email address, and copy your supervisor in to the email in which you submit this application***

**All Staff and Research Students must complete this declaration:**

**I confirm that I have sent a copy of this application to my Head of Department** (or their delegated representative). **Tick here to confirm**   
**Name of Head of Department** *(or their delegated representative)*  Dr. Adrian Friday

**Applicant electronic signature**: Muhammad Umair; Date 13/1/2019

School of Computing and Communications

**Participant information sheet**

For further information about how Lancaster University processes personal data for research purposes and your data rights please visit our webpage: [www.lancaster.ac.uk/research/data-protection](http://www.lancaster.ac.uk/research/data-protection)

I am a PhD student at Lancaster University and I would like to invite you to take part in a research study that looks at biofeedback based mobile application to achieve synchrony between participants.

Please take time to read the following information carefully before you decide whether or not you wish to take part.

**What is the study about?**

This study looks at the topic of achieving synchrony between two people and its applications in real world scenarios when supported by feedback on breathing.

**Why have I been invited?**

We require pairs of participants for the research study in order to track data on the effectiveness of a biofeedback app to help users achieve synchrony.

We would be very grateful if you would agree to take part in this study.

**What will I be asked to do if I take part?**



If you were to take part in the study, you and your partner will be asked to wear a breathing sensor while you use a mobile application in the lab and over the course of 3 days. The sensor contains an adjustable elastic fastening strap that you will wear on the chest, which records breathing patterns.

After this stage of the project is complete, interviews will be held with yourself and your friend, or partner to gather feedback. Over the course of the study, textual data by the sensors, the feedback you provide during interviews along with audio and video recordings of the interviews will be used for educational purposes.

**What are the possible benefits from taking part?**

Benefits could include increased understanding of your breathing patterns, as well as possible increased self-realization and understanding of your partners’ breathing patterns. You will be paid £8 pounds for your participation as an amazon voucher. You will be asked to provide an email address to which the Amazon voucher will be sent. We will not store your email address once the vouchers has been dispatched.

**Do I have to take part?**

No. It’s completely up to you to decide whether or not you take part. Your participation is voluntary, and you are free to withdraw at any time during the study, without giving any reason. If you have difficulties in breathing or have chronic breathing problem, then you cannot take part in this study. You cannot take part in the study if you are under 20 or above 50 years of age.

**What if I change my mind?**

As explained above, you are free to withdraw at any time during the study without giving any reason and if you want to withdraw, we will extract any data you contributed to the study and destroy it. You may also withdraw from the study a week after you have taken part if you wish, and all data related to you along with personal data used in the study will be destroyed. If you wish to withdraw, you can contact the researchers through phone or email given below.

The rationale for this is that after a week, the data analysis will start and any data which has not been withdrawn until then will be difficult to be withdrawn once the analysis is started.

Data means the information, views, ideas, etc. that you and other participants will have shared with us.

**What are the possible disadvantages and risks of taking part?**

There should be no risks to participating for this study.

**Will my data be identifiable?**

Any data we collect about you will only be accessible to the researchers of this project. Your data will be anonymised shortly after being received. We will only share your anonymized data to the public (i.e. for open access).

**How will my data be stored?**

* Your data will be stored in encrypted files (that is no-one other than us, the researchers and the supervisor will be able to access them) and on password-protected computers.
* We will store hard copies of data (if any) securely in locked cabinets in our office.
* We will keep data that can identify you separately from non-personal information (e.g. your views on a specific topic).
* In accordance with University guidelines, we will keep the textual data securely for a minimum of ten years and the audio/video data will be deleted once the project is over.

**How will we use the information you have shared with us and what will happen to the results of the research study?**

The data collected from participants will solely be used for PhD academic project and may be used in research publications.

**Who has reviewed the project?**

This study has been reviewed and approved by the Faculty of Science and Technology Research Ethics Committee.

**What if I have a question or concern?**

If you have any queries or if you are unhappy with anything that happens concerning your participation in the study, please contact:

Name: Muhammad Umair  
Address: School of Computing and Communications, Lancaster University, LA1 4YW, United Kingdom  
Telephone: 07477 921206  
Email: m.umair7@lancaster.ac.uk

If you have any concerns or complaints about the study, you can also contact:

Project supervisor

Name: Prof. Corina Sas

Address: InfoLab21, Lancaster University, LA1 4WA, United Kingdom.

Telephone: 01524 510318

Email: c.sas@lancaster.ac.uk

Head of Department

Name: Prof. Adrian Friday

Address: InfoLab21, Lancaster University, LA1 4WA, United Kingdom

Telephone: 1524 510326

Email: a.friday@lancaster.ac.uk

**Thank you for considering your participation in this project.**

**CONSENT FORM**

**Project Title: Synch with me: A mobile app to achieve breathing synchrony**

Name of Researchers: Muhammad Umair

Email: m.umair7@lancaster.ac.uk

1**Please tick each box**

1. I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily
2. 1I understand that my participation is voluntary and that I am free to withdraw at any time during the study, and within one week after the study, without giving any reason.
3. I understand that any information given by me may be used in future reports, academic articles, publications or presentations by the researcher/s, but my personal information will not be included and I will not be identifiable.

1

1. I understand that my name/my organisation’s name will not appear in any reports, articles or presentation without my consent.
2. I understand that pictures and videos may be taken at points, but they will be taken as so they do not reveal my identity.

1. I understand that my audio and biological signals i.e. breathing rate will be recorded and used for research purposes, my data will be anonymized and protected on encrypted devices and kept secure.



1. I understand that data will be kept according to University guidelines for a minimum of 10 years after the end of the study.
2. I agree to take part in the above study.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_          \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_             \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
Name of Participant                      Date                                Signature

**I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.**

**Signature of Researcher /person taking the consent\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_**Day/month/year

**One copy of this form will be given to the participant and the original kept in the files of the researcher at Lancaster University**

If you have any queries or if you are unhappy with anything that happens concerning your participation in the study, please contact:

Name: Muhammad Umair  
Address: School of Computing and Communications, Lancaster University, LA1 4YW, United Kingdom  
Telephone: 07477 921206  
Email: m.umair7@lancaster.ac.uk

If you have any concerns or complaints about the study, you can also contact:

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Head of Department

Name: Prof. Corina Sas

Address: InfoLab21, Lancaster University, LA1 4WA, United Kingdom

Telephone: 01524 510318

Email: c.sas@lancaster.ac.uk

**Thank you for considering your participation in this project**

**Participant Debrief Sheet**

Thank you for participating in this study. We hope that you have found it interesting.

This study looked at the feasibility of a mobile application to achieve breathing synchrony between two people. In the next step, we will analyse the feedback you provided which will help improve the mobile application. The results will also be used in a conference/journal paper.

We will send you the participation amazon voucher by email.

If you have any further questions, you can contact:

Project Supervisor:

Prof. Corina Sas, School of Computing and Communications, Lancaster University, Tel. 015245 10318, Email: [corina@comp.lancs.ac.uk](mailto:corina@comp.lancs.ac.uk)

**Interview Guide**

Age: ;Gender:

How would you describe your experience of achieving synchrony? Please Explain.

What would be some words you use to describe this experience?

Were you easily able to sync with you partner? Please Explain, How?

Was it different when you were together or apart?

How did this experience help you in anyway? How and Why?

Do you feel like you learned anything from participating?

Have you done this exercise before? How different it is using an application or achieving sync without the technology?

Did you experience anything during your participation that you didn’t initially expect?

Would to like to improve anything?

Would you like to use it often? Why? And Why not?