Science & Engineering Research Ethics Committee (SEREC)
Application form: research studies involving human participants

PART A

APPLICANT DETAILS:

The applicant must be the person who will conduct the investigations; each application must be made by ONE applicant. The applicant may be a member of staff or a student (undergraduate or postgraduate) registered with the University of Nottingham.

The application form must be submitted from a University of Nottingham email account.

Applicant name:	Koay Xian Cong
Email address:	ecyxk1@nottingham.edu.my

If the applicant is an undergraduate OR postgraduate student please also complete the section below.

Student ID number:	20418760
Course:	Bachelor of Electrical and Electronic Engineering
Supervisor:	Dr Hermawan Nugroho

For student applicants this form must be submitted via their supervisor's University of Nottingham email account. By doing this the supervisor is indicating that they support the application.

PROJECT DETAILS:

Title of project:	WellnessAI+: Elevating Mental, Emotional and Physical Health with ECG Enhanced Artificial Intelligence
Abstract: Include a brief summary of the project (maximum of 300 words)	The focus of this project is to incorporate electrocardiogram (ECG) and artificial intelligence (AI) driven algorithms to offer a groundbreaking approach to edge computing to not only predict heart disease but also delve into the depths of human emotions. This dual-purpose capability signifies a pivotal leap forward in personalized healthcare and wellness management, ushering in a new era of preventative and predictive medicine. The deployment of AI into edge computers powered by ARM Cortex-M chips will also be further explored and discussed. A health monitoring system that integrates an ECG measurement kit with an STM32 edge computer and a cloud-based computer will be developed. This system comprises two key components: a model for predicting heart disease (cloud computer) and another for real-time emotion recognition (edge computer). The most important goal is to design an electronic circuit which is capable of precisely capturing bioelectric signals from the heart. Next, a data processing technique for obtaining characteristics that hold physiological and physical importance needs to be designed. Additionally, the project explores the utilization of STM32 X-Linux-AI, facilitating the deployment of AI models into the embedded system. The model needs to be lightweight to be embedded into a device to implement edge computing.

PROJECT DETAILS

Application identification number*:	
Study start date (planned):	
Study completion date (planned):	

**Note: the application identification number is the applicant's initials followed by the date of submission. E.g. If John Wong submitted a proposal on 1st September 2013 then the application identification number would be JW010913.*

Previous applications:

Has a similar study been approved by SEREC? If YES, state the title, application identification number and the submission date in the boxes below. This may speed up the review process.

Title of similar study:	
Submission date of similar study:	
Application identification number:	

PART B

1. Will the population studied include any vulnerable groups, e.g. participants aged under 18, disabled or lacking capacity. (If YES, please give further details)

   YES ☑ **NO** ☐

   Studies might involve patients who have heart diseases.

2. Will any participants aged under 18 be involved without the consent of their parents, guardians or carers? (If YES, please give further details). SEREC will only approve 'opt-out' consent in very exceptional circumstances.

   YES ☐ **NO** ☑

3. Excluding consent forms, will it be possible to associate specific information in your records with specific participants on the basis of name, position or other identifying information contained in your records? (If YES, please give further details)

   YES ☐ **NO** ☑

4. Will persons participating in the study be subjected to physical or psychological discomfort, pain or aversive stimuli, which are more than expected from everyday life? (If YES, please give further details).

   YES ☐ **NO** ☑

5. Will any inducement, other than reasonable expenses / compensation for time, be given to participants? (If YES, please give further details).

   YES ☐ **NO** ☑

6. Will any participants involved in this study be doing so without their knowledge and consent, e.g. covert observation? (If YES, please give further details).

YES	NO
☐	☑

7. Will the investigation involve any blood or tissue samples being taken from the participant? (If YES, please give further details including an explanation of how these samples will be stored and disposed of).

YES	NO
☐	☑

8. Will the investigation involve any drugs, placebos or any other substances (supplements, vitamins) being administered to patients? (If YES, please give further details).

YES	NO
☐	☑

9. Will the investigation require the participant to undergo any type of surgical / invasive procedure, physiological / psychophysiological monitoring, TMS or fMRI studies? (If YES, please give further details).

YES	NO
☑	☑

Participant may need to wear ECG sensors at different parts of the body.

10. Will the participant be exposed to any unpleasant, loud or prolonged (or multiple) stimuli/testing or deprivation or restriction, e.g. of food or sleep? (If YES, please give further details).

YES	NO
☐	☑

11. Will participants engage in strenuous or unaccustomed physical activity? (If YES, please give further details).

YES	NO
☐	☑

12. Will the investigation use procedures designed to induce participants to act contrary to their wishes or that will affect their ability to give continuing consent, e.g. hypnosis, alcohol use? (If YES, please give further details).

YES	NO
☐	☑

13. Will the investigation involve any procedures which participants might not feel free to withdraw from or that they may regret taking part in? (If YES, please give further details).

YES	NO
☐	☑

14. Is the investigation likely to intentionally or unintentionally induce embarrassment, humiliation, lowered self-esteem, guilt, conflict, anger, discouragement or other emotional reactions? (If YES, please give further details).

YES	NO
☑	☐

Studies on emotion recognition based on ECG signals may induce certain emotional reactions.

15. Will participants be required to recall personal memories or induced to disclose information of an intimate or otherwise sensitive nature, e.g. relationships, feelings of success? (If YES, please give further details).

YES	NO
☑	☐

Studies on emotion recognition based on ECG signals may induce certain emotional reactions.

16. Will participants be deceived or actively misled in any manner or will information be withheld from them that they might reasonably expect to receive? (If YES, please give further details).

YES	NO
☐	☑

17. Are any participants being knowingly investigated for a problem which has received medical, psychiatric, clinical psychological or other similar attention? (If YES, please give further details).

YES	NO
☐	☑

18. Will the research involve potentially sensitive topics, e.g. sexual, racial, religious or political attitudes?

YES	NO
☐	☑

19. Is there the possibility of the disclosure of confidential information, by participants or researchers, during the course of the study, e.g. to other participants? (If YES, please give further details).

YES	NO
☐	☑

20. Will any of the research activities be taking place outside of Malaysia or the UK? (If YES, please give further details).

YES	NO
☐	☑

21. Are you aware of any other ethical concerns that are not identified in the application? (If YES, please give further details).

YES	NO
☐	☑

For "minimal risk" projects the applicant only needs to complete Part A and Part B before submitting the Application Form to their School Research Officer.

PART C

Part C should only be completed if the project is considered to be greater than "minimal risk" whereby you answered at least ONE question with "YES" in part B

This section outlines the supporting information that should be submitted with your application.

Checklist of information to include with your application (please tick)

☐	A description of the study design (maximum 3000 words) which should cover, but is not limited to: – Rationale for the research – Number and type of participants – Number and duration of activities participants will be involved in – Equipment and procedures to be applied – Information about how participants will be recruited – Whether participants will be compensated (state how this will be done) – How participants will be informed that they may withdraw at any time – Plans to ensure participant confidentiality and anonymity – Plans for storage and handling of data – Information about what will happen to the data after the study – Information about how any data and images may be used – Statistical significance of the number of participants
☐	Copies of any information to be given to participants. (This includes recruitment information e.g. adverts, posters, letters).
☐	A copy of the participant consent form.
☐	Copies of data collection sheets, e.g. questionnaires.
☐	Any other information (please state)

Where possible ALL supporting documents should be submitted as pdf files.

By submitting this application I confirm that I understand the ethical requirements for my study and have read and complied with the University of Nottingham Code of Research Conduct and Research Ethics.

By completing this form, researchers are conforming to the use of the following official forms:
Covid-19 risk information sheet for participants-UNM version 1, July 2020 (only for face to face investigation)
SEREC Information Sheet and Consent Form - version 3, 22 May 2023
Research participant privacy notice - UNM version 2, Oct 2021

Please send this completed form and all the supporting documents to our Ethics Administrator: Serec@nottingham.edu.my