Request for ethical approval for students on taught programmes

Please complete this form and return it to your supervisor as advised in your module handbook. Feedback on your application will be via your supervisor or co-ordinator.

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Programme name and code	**BSc Computer science**
Module name and code	**Name: Independent Studies Code:** 6CC995
Name of supervisor	**Andreas Plageras**
Name of co-ordinator	**Syulianoy Tasos**

Title of proposed research study
Internet of Artificially Intelligent Things A Case study on Security And Privacy On Drones.

Supervisor Comments

Are the ethical implications of the proposed research adequately described in this application?	Yes ❑	No ❑	
Does the overall study have low, moderate or high risk in terms of ethical implications?	Low ❑	Moderate ❑	High ❑
Does the study method describe a process of research that is ethically sound?	Yes ❑	No ❑	

Signatures

The information supplied is, to the best of my knowledge and belief, accurate. I clearly understand my obligations and the rights of the participants. I agree to act at all times in accordance with University of Derby Policy and Code of Practice on Research Ethics:
 http://www.derby.ac.uk/research/uod/ethics/

Signature of applicant	
Date of submission by applicant	11/30/2021
Signature of supervisor	
Date of signature by supervisor	
For Committee Use Reference Number (Subject area initials/year/ID number)………………..	

Date received……………… Date approved ……………   Signed………………………

Comments

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1. What is the aim of your study? What are the objectives for your study?

The main purpose of this study is to evaluate the security and privacy of drones, examine how Artificial Intelligence can be applied on them and eventually aid the future and further development and use of drones.

The objectives are as follows:
1) To identify the ways in which drones can be secured and contribute to social security and privacy of users.
2) To study existing and propose novel software that demonstrates the functionality of security and privacy in applications.
3) To explore existing and potential AI applications for drones.
4) To evaluate security and privacy issues and propose new ways of defence mechanisms
5) To provide results of drone applications development with the help of AI and construction of face recognition system regarding to it.

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2. Explain the rationale for this study (refer to relevant research literature in your response).

Drones have positively affected our lives and are playing a significant role in our every day lives, by aiding humans with good deliverance, flying from differents points and also attempting to aid various situations. The main purpose of drones working in a specific area of interest is to provide their services to as many humans as possible and also offer their speed and accuracy. Specifically, different working environments that can be covered by drones are the main category of cinematography, where drones can be used to provide a better aerial view of the current film like never before. Furthermore, in Natural Disaster Responses and Control, drones can play a crucial role in hurricanes and generic disasters, where drones can cover long distances of aerial ground to report fallen trees, cars and even missing human beings. Moreover, in tourism, drones can also get unique pictures from beautiful landscapes and provide future clients or tourists with a bird's eye view of their place of wish. Additionally, in case of a terrorist attack, UAVs can also offer being hotspots or base stations, that aid affected people or can be also used to alert response teams in heavy situations. Finally, drones can be used as mobile medical kits to provide first aid response on affected and needy people. In detail, UAVs can be used as delivery aircrafts in order to supply isolated or infected patients with food or water and also to deliver small packages in s short period of time.

The number of drones is increasing rapidly day by day and therefore aerial traffic jam is expanding exponentially. The latter has raised security and privacy concerns on the low aerial space. Recently, malicious use of drones and cyber-criminals has arisen. The frequency and the probability of cyber-attacks have been increased significantly. For that reason, efficient and innovative methods for security and privacy are of vital importance.

Lin, C., He, D., Kumar, N., Choo, K.-K.R., Vinel, A. and Huang, X. (2018). Security and Privacy for the Internet of Drones: Challenges and Solutions. *IEEE Communications Magazine*, 56(1), pp.64–69.

Labib, N.S., Brust, M.R., Danoy, G. and Bouvry, P. (2021). The Rise of Drones in Internet of Things: A Survey on the Evolution, Prospects and Challenges of Unmanned Aerial Vehicles. *IEEE Access*, 9, pp.115466–115487.

Shafique, A., Mehmood, A. and Elhadef, M. (2021). Survey of Security Protocols and Vulnerabilities in Unmanned Aerial Vehicles. *IEEE Access*, 9, pp.46927–46948.

Yaacoub, J.-P. and Salman, O. (2020). Security Analysis of Drones Systems: Attacks, Limitations, and Recommendations. *Internet of Things*, [online] p.100218. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7206421/.

3. Provide an outline of study design and methods.
My study is divided into two sections theoretical and practical. My development methodology for the practical part will be waterfall.
In the theoretical part the areas that I will focus my research are:
- Drones' hardware.
- Drones' network also known as IOD (Internet of drones).
- Drones' privacy and security issues.
- Defence mechanisms and applications for security and privacy.
- Drones' applications in general and specifically in social security.

The practical part will be divided into 5 sections
- Requirement analysis
- Design
- Development
- Testing
- Deployment

The application will aim to enhance security on IOD (internet of drones) and produce an innovative way to reinforce social security.

4. Please provide a detailed description of the study sample, covering selection, sample profile, recruitment and if appropriate, inclusion and exclusion criteria.
Not Applicable

5. Are payments or rewards/incentives going to be made to the participants? Yes ☐   No ☐
If so, please give details below.

6. **Please indicate how you intend to address each of the following ethical considerations in your study. If you consider that they do not relate to your study please say so.**

Guidance to completing this section of the form is provided at the end of the document.

    a. **Consent N/A**

    b. **Deception N/A**

    c. **Debriefing N/A**

    d. **Withdrawal from the investigation N/A**

    e. **Confidentiality N/A**

    f. **Protection of participants N/A**

    g. **Observation research N/A**

    h. **Giving advice N/A**

    i. **Research undertaken in public places N/A**

    j. **Data protection N/A**

    k. **Animal Rights N/A**

    l. **Environmental protection N/A**

7. **Are there any further ethical implications arising from your proposed research? Yes ☐   No ☐**

   If your answer was no, please explain why.

8. **Have / do you intend to request ethical approval from any other body/organisation? Yes ☐ No ☐**
   If 'Yes' – please give details

9. **What resources will you require? (e.g. psychometric scales, IT equipment, specialised software, access to specialist facilities, such as microbiological containment laboratories).**

Drone for the deployment of the application and related software.

10. **What study materials will you use? (Please give full details here of validated scales, bespoke questionnaires, interview schedules, focus group schedules etc and attach all materials to the application) Not applicable on my study.**

Which of the following have you appended to this application?

❑ Focus group questions   ❑ Psychometric scales

❑ Self-completion questionnaire   ❑ Interview questions

❑ Other debriefing material   ❑ Covering letter for participants

❑ Information sheet about your research study   ❑ Informed consent forms for participants

❑ Other (please describe)

PLEASE SUBMIT THIS APPLICATION WITH ALL APPROPRIATE DOCUMENTATION

Advice on completing the ethical considerations aspects of a programme of research

Consent
Informed consent must be obtained for all participants before they take part in your project. The form should clearly state what they will be doing, drawing attention to anything they could conceivably object to subsequently. It should be in language that the person signing it will understand. It should also state that they can withdraw from the study at any time and the

measures you are taking to ensure the confidentiality of data. If children are recruited from schools you will require the permission, depending on the school, of the head teacher, and of parents. Children over 14 years should also sign an individual consent form themselves. If conducting research on children you will normally also require Criminal Records Bureau clearance. You will need to check with the school if they require you to obtain one of these. It is usually necessary if working alone with children, however, some schools may request you have CRB clearance for any type of research you want to conduct within the school. Research to be carried out in any institution (prison, hospital, etc.) will require permission from the appropriate authority.

Covert or Deceptive Research
Research involving any form of deception can be particularly problematical, and you should provide a full explanation of why a covert or deceptive approach is necessary, why there are no acceptable alternative approaches not involving deception, and the scientific justification for deception.

Debriefing
Debriefing is a process of reflection once the research intervention is complete, for example at the end of an interview session. How will participants be debriefed (written or spoken feedback)? If they will not be debriefed, give reasons. Please attach the written debrief or transcript for the oral debrief. This can be particularly important if covert or deceptive research methods are used.

Withdrawal from investigation
Participants should be told explicitly that they are free to leave the study at any time without jeopardy. It is important that you clarify exactly how and when this will be explained to participants. Participants also have the right to withdraw their data in retrospect, after you have received it. You will need to clarify how they will do this and at what point they will not be able to withdraw (i.e. after the data has been analysed and disseminated).

Protection of participants
Are the participants at risk of physical, psychological or emotional harm greater than encountered ordinary life? If yes, describe the nature of the risk and steps taken to minimise it.

Observational research
If observational research is to be conducted without prior consent, please describe the situations in which observations will take place and say how local cultural values and privacy of individuals and/or institutions will be taken into account.

Giving advice
Students should not put themselves in a position of authority from which to provide advice and should in all cases refer participants to suitably qualified and appropriate professionals.

Research in public places

You should pay particular attention to the implications of research undertaken in public places. The impact on the social environment will be a key issue. You must observe the laws of obscenity and public decency. You should also have due regard to religious and cultural sensitivities.

Confidentiality/Data Protection

You must comply with the Data Protection Act and the University's Good Scientific Practice http://www.derby.ac.uk/research/policy-and-strategy This means:

- It is very important that the Participant Information Sheet includes information on what the research is for, who will conduct the research, how the personal information will be used, who will have access to the information and how long the information will be kept for. This is known as a 'fair processing statement.'
- You must not do anything with the personal information you collect over and above that for which you have consent.
- You can only make audio or visual recordings of participants with their consent (this should be stated on the Participant Information sheet)
- Identifiable personal information should only be conveyed to others within the framework of the act and with the participant's permission.
- You must store data securely. Consent forms and data should be stored separately and securely.
- You should only collect data that is relevant to the study being undertaken.
- Data may be kept indefinitely providing its sole use is for research purposes and meets the following conditions:
- The data is not being used to take decisions in respect of any living individual.
- The data is not being used in any which is, or is likely to, cause damage and/or distress to any living individual.
- You should always protect a participant's anonymity unless they have given their permission to be identified (if they do so, this should be stated on the Informed Consent Form).
- All data should be returned to participants or destroyed if consent is not given after the fact, or if a participant withdraws.

Animal rights.

Research which might involve the study of animals at the University is not likely to involve intrusive or invasive procedures. However, you should avoid animal suffering of any kind and should ensure that proper animal husbandry practices are followed. You should show respect for animals as fellow sentient beings.

Environmental protection

The negative impacts of your research on the natural environment and animal welfare, must be minimised and must be compliant to current legislation. Your research should appropriately weigh longer-term research benefit against short-term environmental harm needed to achieve research goals.