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## Taught Programme Research Ethics Approval Application Form

Research undertaken by taught students must receive ethical approval unless deemed exempt. This application form may be completed by an individual student or by a Programme Board/Lecturer for a group of similar research projects.

This application is completed by:

Student: ✓

OR

Lecturer on behalf of Programme Board: ☐

### PART A

Applicant Details	
Name:	Otito Mbelu, Rodrigo Almeida
Student ID:	G00397738, G00377123
Programme Title:	Computing in Software Development
Programme Stage:	Year 4
Research Supervisor's Name:	Dr. Damien Costello

Project Details	
Research Study Title:	Biometric Data Analysis in Digital Game Scenario
Research Study Summary (max 100 words):	
<p>The main hypothesis of this research is to find if there is any correlation between a user's biometric data and their performance in a first-person shooter game scenario.</p> <p>This research study will try to quantify how biometric data such as Heart Rate Variation, Heart Rate, active steps taken, quality and quantity of sleep, etc. affect select gaming skills like eye-to-hand coordination, fine-motor skills and reaction time.</p>	

Risk Checklist			
Please answer ALL the questions in each of the sections below – Tick YES or NO			
	Will the research study....?	YES	NO
1	Involve direct and/or indirect contact with human participants?	✓	
2	Involve analysis of pre-existing data which contains personal or sensitive information not in the public domain?		✓
3	Require permission or consent to conduct?	✓	
4	Require permission or consent to publish?		✓
5	Have a risk of compromising confidentiality?		✓
6	Have a risk of compromising anonymity?		✓
7	Collect/contain personal data i.e. any information that relates to an identified or identifiable individual?		✓
8	Collect/contain sensitive personal data e.g. health data, sexual orientation, race religion?	✓	
9	Contain elements which you OR your supervisor are NOT trained to conduct?		✓
10	Use any information OTHER than that which is freely available in the public domain?		✓
11	Involve respondents to the internet or other visual/vocal methods where participants may be identified?		✓
12	Include a financial incentive to participate in the research?		✓
13	Involve our own students or staff?	✓	
14	Take place outside Ireland?		✓
15	Involve participants who are vulnerable or at risk?		✓
16	Involve any participants who are unable to give informed consent?		✓
17	Involve data collection taking place BEFORE informed consent is given?		✓
18	Involve any deliberate deception or covert data collection?		✓
19	Involve a risk to the researcher or participants beyond that experienced in everyday life?		✓
20	Cause (or could cause) physical or psychological harm or negative consequences?		✓
21	Use intrusive or invasive procedures?		✓
22	Involve a clinical trial?		✓

<b>Risk Checklist</b> Please answer ALL the questions in each of the sections below – Tick YES or NO			
	Will the research study....?	YES	NO
23	Involve the possibility of incidental findings related to participant health status?		✓
24	Involve the remuneration of research participants?		✓

If, as a student, you answered **NO** to all the above questions your research supervisor will review, and if in agreement sign below to indicate that this form does not have to be submitted to the Taught Programme Research Ethics Committee.

<i>Name</i>		<i>Signed</i>		<i>Date</i>	
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If you answered **YES** to any of the above questions, you need to complete part B below.

## PART B

1	<b>Project Overview</b>
<p><b>Please give a brief overview of the study, including a summary of the aims and objectives.</b></p> <p><u>Help:</u> Describe the purpose of the research and what question(s) the project should answer.</p>	
<p>Introduction to PUBG: PUBG, short for Player Unknown's Battlegrounds, is a popular online multiplayer battle royale game developed and published by PUBG Corporation, a subsidiary of Bluehole Studio. In PUBG, up to 100 players parachute onto an island and scavenge for weapons and equipment to kill others while avoiding getting killed themselves. The game features a shrinking safe area to force players into close encounters, promoting tactical gameplay and intense firefights. The last player or team standing wins the game. PUBG became widely popular upon its release in 2017 and is available on various platforms, including PCs, consoles, and mobile devices<sup>1</sup>. Since its launch in 2017, PUBG has become incredibly popular, with more than 280M active players. People of all ages and from all over the world enjoy playing this game. In PUBG, players need good hand-eye coordination and quick reflexes to compete well against others. The game offers a variety of weapons, and players can customize their controls to fit their preferences. This project builds upon the research done by university students, focusing on collecting biometric data to improve player performance in digital games.</p> <p>The original project, titled "Biometric Data Collection for Performance Optimization in a Digital Game Scenario", aimed to find out if a player's body data could help them play a video game better. The researchers set up a practice game similar to PUBG: Battlegrounds, with the same weapons and controls in a Unity Desktop Application. Biometric data was supplied by a Smart Watch. In this instance, the only data used to test the application was produced by the developers themselves and from the stakeholders, for this reason, it wasn't necessary an Ethics application as there wasn't a recruitment of volunteers at the time. The goal of the original project was to see if there was a connection between how players performed in the game and their body data. In our third-year project, our team was given the challenge of enhancing the visualization of data from both the test games and the Polar API. To achieve this, we developed a chart API, enabling users to conveniently view all the results on a single page. The chart API was specifically created to present the data collected during the initial research in a coherent and user-friendly chart format, integrating various user data into one unified visual representation.</p> <p><b>Project Objective</b> The aim of this research project is to overcome the limitations mentioned in previous projects and complete the future development goals of both projects. These include:</p> <ul style="list-style-type: none"> <li>• Chart API Integration: Integration of developed Chart API into the test application.</li> <li>• Offline Data Storage: Provision will be made for offline temporary file storage to improve the overall reliability of the whole system</li> <li>• PUBG API: Further research on new developments in the PUBG API for better user experience.</li> </ul> <p>And eventually, seek to answer the following research questions:</p> <ul style="list-style-type: none"> <li>- Can the user's current physical condition as indicated by their Biometric data, have any direct relationship with their performance in such a gaming scenario?</li> <li>- Can Biometric and test data help suggest the most suitable settings for different game scenarios?</li> </ul>	

2	Methodology
<p><b>Please give a description of the methodology, including any data collection and analysis methods.</b></p> <p><u>Help:</u> Give an outline of the study here. If the project is complex, you can also submit the research proposal/protocol (no more than 2-3 A4 sides) if this would help the reviewer's understanding of the project. Include details of your (or the Research Supervisor's) appropriate skills and qualifications to carry out this research. Consideration of how, and for what duration are stored should be provided under Section 7 below.</p>	
<p>This research is geared towards finding a correlation between users' biometric data to their performance in a first-person shooter gaming scenario. The quality of the user data collected will be critical in ensuring that the research aims are achieved. For Quality Assurance purposes, a systematic step-by-step approach has been designed for the data capturing process.</p> <p>An activity monitoring device will be distributed to volunteers in the form of a Polar Watch. Individuals are expected to use these devices at a pre-designated times prior to undertaking a test in the form of a First-Person Shooter Game. Results from the test will be paired with their biometric data for further analysis.</p> <p>Data of Interest</p> <p>For the purpose of the research, different categories of data will be collected from the volunteers through the monitoring device to help achieve the stated goals. These data relate to the volunteer's physical information, sleep data, daily activities, and nightly recharge.</p> <p>For the Test Game, volunteers are expected to play a total of 3 different categories of test to gauge their performance in these tests. The tests are Audio Test, Visual Test, and Fine Motor Test. The tests are designed to be played sequentially and will typically take a total of 15 minutes to conclude.</p> <p>Procedure</p> <p>The data collection process is expected to follow the below listed steps to maximize throughput and minimize the average time spent processing each participant.</p> <p>Location</p> <p>The data collection effort will be carried out at the Gym on the Atlantic Technological University (ATU) Galway campus.</p> <p>Time</p> <p>The following weekly schedule will be available for volunteers at various times that best suit their personal schedule.</p> <ul style="list-style-type: none"> <li>· Tuesdays: 12:00 - 13:00, 15:00 - 16:00</li> <li>· Wednesdays: 12:00 - 13:00, 15:00 - 16:00</li> <li>· Thursdays: 12:00 - 13:00, 15:00 - 16:00</li> <li>· Fridays: 13:00 - 15:00</li> </ul>	

Note: The timing is open for adjustment to suite volunteers

#### Biometric Data Procedure:

For the very first time processing a volunteer, some user information will be needed to have them registered with the activity monitoring device and their data is saved to the manufacturer's repository.

The Activity Monitoring Device to be used in this research is the Polar Vantage Smart Watch. The watch is capable of monitoring and capturing user's biometric data and saving the data to a repository where it can be accessed online via an API. The device is commercially available and accessible to the public. The rationale for using the Polar Vantage Watch is because it has been widely used in both academic and industrial research projects and validation. Most importantly, these devices are available to us in such quantity that can satisfy our research needs.

#### Physical Information

These are the first group of data to be collected about the individual to register the Monitoring device manufacturer. The data is stored with the manufacturer (Polar) which is GDPR compliant.

#### Sleep Data

According to the manufacturer's manual, the watch is capable of recording the quality and quantity of sleep and also showing how long spent on each stage of sleep. Light Sleep, Deep Sleep, and REM Sleep with the duration of each type of sleep. For the purpose of the research, an aggregated total of the various categories of sleep will be recorded and used.

Volunteers are expected to wear the watch to sleep the previous night before their scheduled test

- Sleep (minutes)

#### Daily Activities

According to the Activity monitor manufacturers' manual, "Polar device uses an internal 3D accelerometer to record your wrist movements. It analyses the frequency, intensity and regularity of your movements together with your physical information." calories, active calories, active steps and their respective durations are collected from through the device. For the purpose of the research, the active steps will be used.

Volunteers are expected to wear the previous day for this data to be available.

- Active Steps (count)

#### Nightly Recharge

From the Activity monitor manufacturers' manual, the Nightly Recharge is recorded as follows: " is an overnight recovery measurement that shows how well your body has coped with overall stress you have experienced lately." The parameters, measured during roughly the first four hours of your sleep are heart rate, heart rate variability and breathing rate. For the purpose of the research, the following parameters and derived parameters will be used:

- Heart Rate Average (bpm)
- Heart Rate Maximum (bpm)

· Heart Rate Variability (HRV)

Once again, volunteers are expected to wear the watch to sleep the previous night before their scheduled test.

## Test Data Collection

The test data is generated at the completion of the test session in the Test Application. A test session consists of three categories of tests, which will be undertaken sequentially in different stages. For quality assurance, the test will be undertaken in a controlled environment using the same hardware in similar conditions over the course of the trials.

For the purpose of the trial, a special designated room has been reserved for the data collection effort. The following metrics for the different tests will be captured and will be subsequently used for the research effort.

**Audio Test:** designed to test users' auditory precision. This test is expected to generate.

**Average Response Time:** this is a measure of how quickly a user is able to react and identify the source of a sound with varying audibility (in decibels) in a 3-Dimensional space.

**Visual Test:** designed to test users' visual perception. At the end of this category of test, the following metrics were designed to measure users' performance.

**Average Response Time:** a measure of how quickly a user can identify and engage targets.

**Shot Accuracy:** a measure of the percentage of successful shots to the number of targets spawned.

**Target Accuracy:** a measure of the percentage of successful shots taken to a number of targets hit.

**Fine Motor Test:** designed to test users' perception of depth and eye to hand coordination.

**Average Tracking Time:** measure of average time it took for a player to successfully track, engage, and eliminate a target.

**Accuracy:** measure of the percentage of shots fired to the number of targets hit.

3	<b>Main Ethical Considerations</b>
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**Please give a brief description of the main ethical considerations involved in the study.**

Help: Highlight here the main ethical considerations for the study (which may concern, e.g., the type of participants, the sensitive nature of the study, the data collection process, and security-sensitive research) and advise how the main issues will be addressed. If the project is funded, give details here, and whether there are any potential conflicts of interest involved in the study. NB: Section 5 below addresses: recruitment; voluntary participation; consent; and, the right to withdraw. Those details need not also be entered here.

There are no conflicts of interest, and the project is not funded.

<b>4</b>	<b>Human Participants</b>
<p><b>If the study includes Human Participants (or their data), please give a description of who will be included.</b></p> <p><u>Help:</u></p> <ul style="list-style-type: none"> <li>• Please note this should include sample size/number of participants, whether the project will focus on any particular groups/individuals, if it will include any at risk or vulnerable participants, participants aged 16 years or under, etc. Please also specify the rationale for including/excluding groups of participants.</li> <li>• If the research involves secondary data not in the public domain, give details in this section.</li> </ul> <p>For the research, physically active individuals that participate in work out activities at a minimum of 3 days a week are desired. Furthermore, the participants are expected to be regular console game players.</p> <p>We expect a minimum of 4 participants to make the research viable and a maximum of 20 volunteers which will be separated into a control group and intervention groups.</p>	

<b>5</b>	<b>Recruitment, Voluntary Participation, Consent and Right to Withdraw</b>
<p><b>If the study includes Human participants, please give a brief description of the recruitment process, how voluntary participation will be ensured, if (and how) informed consent will be obtained prior to participants taking part in the study, and the right of withdrawal from the research process.</b></p> <p><u>Help:</u></p> <ul style="list-style-type: none"> <li>• This should include clear information on how participants will be identified, approached and recruited; whether the study will include any covert research or deliberate deception; whether help is required from a third party/ gatekeeper to access participants; what information will be given to participants, etc.</li> <li>• If expenses or any incentives are to be offered to participants, give full details.</li> <li>• If research involves students, colleagues and/or other employees then specify the rationale for this and how issues of coercion or feelings of obligation will be addressed.</li> <li>• <u>If data is held on participants, research using that data may require permission from the participant.</u></li> <li>• Regarding withdrawal from the study, discuss the different stages/dates a participant could withdraw or withdraw their data, and how they could do this.</li> </ul> <p>The poster below will be printed and placed around the ATU Campus. It will also be sent through email to all students registered on Galway Campus. The poster contains an electronic form that volunteers will be prompted to fill out when scanning the QR code from the poster or accessing the link <a href="https://forms.office.com/e/EmhfampDUT">https://forms.office.com/e/EmhfampDUT</a>.</p> <p>Once volunteers register interest the email address will be kept as stated in the form and then we will contact them through their registered email.</p>	



**GAMERS AND FITNESS ENTHUSIASTS**  
**WE NEED YOU**  
**RESEARCH PARTICIPANTS NEEDED**

Atlantic Technological University  
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SCAN THE QR CODE OR CHECK IF YOU QUALIFY

QUESTIONS OR TROUBLE ACCESSING IT?  
 PLEASE EMAIL G00377123@ATU.IE

6	Risks and Benefits
	<p><b>Please give a brief description of how, when and where the research will take place and whether there are any risks and/or benefits involved.</b></p> <p><u>Help:</u></p> <ul style="list-style-type: none"> <li>• This should include information on what participants will be required to do, the rationale for this and the level of risk involved.</li> <li>• When considering risks, please refer to risks to the participants (e.g., for research in sensitive areas, where there is a balance of power), the researcher, any other parties to the research; and also any health and safety issues for anyone involved (e.g., for lone researchers carrying out fieldwork).</li> </ul>
	<p>The research is a software project that analyses data and does not involve the volunteers performing any physical activity other than does in their normal routine.</p> <p>Volunteers are expected to wear a biometric data monitoring device that records physical activities.</p> <p>The volunteers are expected to play a game that will be installed on their computer. On average the game is expected to last for 15 minutes.</p> <p>Data from the game and device monitor are collected during gameplay and stored in a secured database.</p> <p>Regression and Correlation analysis are done using these data.</p>

7	Personal Data, Anonymity and Confidentiality
<p><b>Please specify what type of information/data will be collected/analysed and the source(s). In addition, specify if and how the anonymity of participants will be ensured, and information be kept confidential.</b></p> <p><u>Help:</u> This should include information on whether new information/data are being collected or uses data that are already in the public domain; whether the data includes personal data; whether the data includes sensitive personal data e.g. health data, sexual orientation, race, religion; how the data will be processed and stored; who will have access to it; who it will be shared with; how long data will be retained; how it will be destroyed; the Data Protection requirements for any sensitive personal data, etc. In addition, include whether there may be any requirements for disclosure of information to other parties due to professional practice or legal reasons. If there are limits to confidentiality, explain clearly how the participants would be advised about these limits and possible outcomes.</p>	
<p>There are basically two categories of data to be collected which are:</p> <ul style="list-style-type: none"> <li>• Game test data that are generated during gameplay.</li> <li>• Biometric data is obtained from a biometric data monitor (watch).</li> </ul> <p>Specifically, the data to be collected from the Biometric data monitor are exhaustively listed below:</p> <ul style="list-style-type: none"> <li>• Maximum Heart Rate</li> <li>• Average Heart Rate</li> <li>• Active Steps</li> <li>• HRV</li> <li>• Sleep (hours)</li> </ul> <p>To get a volunteer setup for data collection, the volunteer will have to register with the activity monitor manufacturer (i.e. Polar Flow). Such information like height, weight, etc will be taken to ensure the accuracy of data being collected by the activity monitor as advised in their documentation. These data are not of interest to the research and will be stored with the Activity monitor manufacturers.</p> <p>Volunteer's data collected will be stored in a Firestore database through Firebase which is a secured Backend-as-a-Service Cloud service that provides encryption, security, and availability. Individual user-specific data are stored with the alias/username they choose to register with.</p> <p><b>** It is important to note that no data will not be traceable to any individual as their data will be annotated with their chosen alias/username.</b></p>	

<b>8</b>	<b>Reporting and Dissemination</b>
<p><b>Please give details of the planned dissemination and specify if the findings from the research will be published and whether any permission is required for this.</b></p> <p><u>Help:</u> This should include information on the methods of dissemination (e.g., dissertation/thesis) and/or what will be published and where (research papers, conference presentations). Specify if any permission is needed (e.g., from participants, clients, gatekeepers, etc.) prior to publication, and whether there are any potential issues relating to Intellectual Property Rights when creating or using materials.</p>	
<p>As indicated in section A. There are no plans at the moment to publish the research.</p>	

<b>9</b>	<b>Location of research</b>
<p><b>Will the research take place outside of Ireland?</b></p>	
<p>YES <input type="checkbox"/> NO <input type="checkbox"/> <b>If yes, give details below.</b></p> <p><u>Help:</u> If yes, please specify where the research will take place. Research must comply with the laws of the country where it is taking place and also comply with local Data Protection and Intellectual Property legislation: you must confirm that your research is compliant with local requirements and how you have ascertained this. Advise if the project requires ethical approval in-country and how this has been ascertained. If approval is required, a copy of this should be included in the application or details of the process of how it will be obtained. Please make reference to insurance and indemnity cover for the project where relevant.</p> <p><u>Note:</u> If data is to be processed or stored outside the EEA contact <a href="mailto:dpo@atu.ie">dpo@atu.ie</a></p>	
<p>NO</p>	

<b>10</b>	<b>Collaborative Projects</b>
<b>Is the research a collaborative project (i.e., it involves more than one institution)?</b>	
<b>YES</b> <input type="checkbox"/> <b>NO</b> <input type="checkbox"/> <b>If yes, give details below.</b>	
<p><u>Help:</u> If yes, please specify the other institutions involved and if ethical approval needs to be / has been given by them. Please also specify what procedures have been put in place to ensure ethical compliance from all partners.</p> <p><u>Note:</u> If personal data is being shared between institutions then a data sharing agreement must be in place. Contact <a href="mailto:dpo@atu.ie">dpo@atu.ie</a></p>	
NO	

<b>11</b>	<b>Any other permission or external ethical approval required to undertake the project</b>
<b>Please specify if the project requires any other ethical approval or permissions not mentioned previously in this application and how and when these will be obtained.</b>	
<p><u>Help:</u></p> <ul style="list-style-type: none"> <li>• Other permissions: ethical approval does not give the right of access to the Institute's students, staff or the use of Institute premises to carry out research, and you may need to contact an appropriate Institute gatekeeper for agreement to approach potential participants or for the use of premises, so please give details.</li> <li>• Gatekeepers: permission of a gatekeeper for initial access to participants may be required or to carry out data collection on their premises.</li> <li>• If the project requires approval from an external ethics committee, this should normally be obtained prior to submitting this application.</li> <li>• If a Disclosure and Barring Service check is required due to the specific participant group, give details.</li> <li>• Regarding insurance and indemnity cover, some projects will require individual confirmation of cover. See the Research Ethics Procedures document for more details.</li> </ul>	
NO	

#### **SUPPORTING DOCUMENTATION: what to submit with the application**

For projects involving human participants, you must submit, where appropriate, the Participant Information Sheet/s and consent form/s. You must also submit every communication a participant will see or receive. Failure to do so will cause delays to the application.

**DECLARATIONS AND SIGNATURES****STUDENT**

*I confirm that I will undertake this project as detailed in Part A and Part B of the application. I understand that I must abide by the terms of this approval and that I may not make any substantial amendments to the project without further approval. I understand that research with human participants or their data must not commence without ethical approval.*

<i>Signed</i>	Rodrigo Almeida	<i>Date</i>	
	Otito Mbelu	31/10/2023	

**RESEARCH SUPERVISOR RECOMMENDATION FOR STUDENT PROJECT**

*I confirm that the committee has considered part A and part B of the application. The project is viable and the student has the appropriate skills to undertake the project. Where applicable, the Participant Information Sheet and recruitment procedures for obtaining informed consent are appropriate and the ethical issues arising from the project have been addressed in the application. I understand that research with human participants must not commence without ethical approval. I recommend this project for approval.*

<i>Name</i>		<i>Signed</i>		<i>Date</i>	
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Comment(s):

E.g. if similar research projects have been previously approved.

**LECTURER ON BEHALF OF PROGRAMME BOARD**

*I confirm that the project will be undertaken as detailed in stage one and stage two of the application. I understand that I must abide by the terms of this approval and that I may not make any substantial amendments to the project without further approval. I understand that research with human participants or their data must not commence without ethical approval.*

<i>Signed</i>		<i>Date</i>	
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**PROJECTS APPROVED BY THE RESEARCH ETHICS SUB-COMMITTEE**

*I confirm that this project was considered by the Taught Programme Research Ethics Committee and has received ethical approval.*

<i>Chair</i>		<i>Signed</i>		<i>Date</i>	
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*This form will be retained for the purposes of quality assurance of compliance and audit for THREE years*



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## **PARTICIPANT INFORMATION SHEET**

### **Biometric Data Analysis in Digital Game Scenario**

We are Rodrigo Almeida and Otito Mbelu and we are students in Bachelor of Science (Honours) in Computing in Software Development at ATU Galway City. We are recruiting volunteers to take part in a research study. The aim of this study is to answer the following research questions:

- Can the user's current physical condition as indicated by their Biometric data, have any direct relationship with their performance in such a gaming scenario?
- Can Biometric and test data help suggest the most suitable settings for different game scenarios?

This participant information sheet outlines what the study involves and what will be required of you if you choose to volunteer to participate.

#### **What is the purpose of this study?**

The main hypothesis of this research is to find if there is any correlation between a user's biometric data and their performance in a first-person shooter game scenario.

This research study will try to quantify how biometric data such as Heart Rate Variation, Heart Rate, active steps taken, quality and quantity of sleep, etc. affect select gaming skills like eye-to-hand coordination, fine motor skills and reaction time.

#### **What will be required of you?**

For this study, you will be required to wear the Polar watch which is referred sometimes to "Activity Monitoring Device" in this text, a day prior to undertaking a test.

#### **Location**

The data collection effort will be carried out at the Gym on the Atlantic Technological University (ATU) Galway campus.

#### **Time:**

The following weekly schedule will be available for volunteers at various times that best suit your personal schedule.

- Tuesdays: 12:00 - 13:00, 15:00 - 16:00
- Wednesdays: 12:00 - 13:00, 15:00 - 16:00
- Thursdays: 12:00 - 13:00, 15:00 - 16:00
- Fridays: 13:00 - 15:00

*Note: The timing is open for adjustment to suit you*

Results from the test will be paired with their biometric data for further analysis.

#### **What will happen to the information that is collected about me?**

The information gathered from the study will be handled in complete confidence and cannot be traceable back to you. These data are stored in an encrypted database system with everything relating to a user linked with the alias (username) they choose to register with. When the study is finished, information will be kept on the researcher Luke Smyth.

**What are the benefits?**

The benefit of taking part in this research is that if such a correlation is found between your biometric data and your performance in the game you can use the results to improve your own performance when setting up in any First-shooter game. You may benefit by taking part in seeing how a final year project is run you may take some valuable knowledge and apply it to your own studies if applicable.

**What are the risks?**

There will be no risks as this study is based on the volunteer's normal activities and playing a game in a controlled environment.

**What if you change your mind during the study?**

Please be aware that individuals who volunteer to take part in the study have the right to withdraw from the project at any time without the need to provide a reason or notice period. Should you feel at any stage that you want to stop taking part in the study, then this is dealt with in a sensitive and confidential manner.

**What happens at the end of the study?**

At the end of the study, the data gathered will be disseminated for the purposes of a written academic report and submitted to ATU for assessment purposes. A summary of the results can be provided to you, upon request. All data will be held securely, in line with GDPR regulations, for a period of ten years, as per the ATU records retention policy.

**What if you have more questions or do not understand something?**

It is important that you feel completely at ease during the research. If you do not understand any aspect of the research, please contact us or my research supervisor to discuss any questions that you might have. Alternatively, you may contact the Head of Department, if you wish to speak to someone independent from the study.

**Research Supervisor:** Dr. Damien Costello

**Head of Department:** Dr. Gareth Roe

Thank you for taking the time to read this. I would be grateful if you would consider participating in this study.

Yours sincerely,

**Student Name:** Rodrigo Almeida, Otito Mbelu

**Student Signature:**

**Date:** *[Insert date of circulation of this document here]*

**Contact Details:** [G00377123@atu.ie](mailto:G00377123@atu.ie) or [G00397738@atu.ie](mailto:G00397738@atu.ie)



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## **PARTICIPANT CONSENT FORM**

### **Effects of Post-Action potentiation on sprint performance**

**Please tick the appropriate boxes**

	<b>YES</b>	<b>NO</b>
1. I have read the Participant Information Sheet for this study and understand what's involved.	<input type="checkbox"/>	<input type="checkbox"/>
2. I have been given the opportunity to ask questions about the study.	<input type="checkbox"/>	<input type="checkbox"/>
3. I agree to take part in the study under the conditions set out in the Participant Information Sheet.	<input type="checkbox"/>	<input type="checkbox"/>
4. I understand that my taking part is voluntary and that I can withdraw my consent at any time before my data is de-identified or amalgamated with other data.	<input type="checkbox"/>	<input type="checkbox"/>
5. I understand that, in any report on the results of this study, my identity shall remain anonymous.	<input type="checkbox"/>	<input type="checkbox"/>

**Signature of Participant:**

**Date:**

**Signature of Student:**

**Date:**

**Appendix D: Participant Withdrawal Form**



## PARTICIPANT WITHDRAWAL FORM

Reference Number:

Participant name or Study ID Number:

Title of Project: Biometric Data Analysis in Digital Game Scenario

Name of Principal Investigator: Rodrigo Almeida and Otito Mbelu

Name of the person to whom this form should be submitted: Gary Flynn

Participant to complete this section. Please initial one of the following boxes:

1. I confirm that I wish to withdraw from the study before data collection has been completed and that none of my data will be included in the study.	
2. I confirm that I wish to withdraw all of my data from the study before data analysis has been completed and that none of my data will be included in the study.	
3. I confirm that although the results of the study have already been produced and cannot change, I wish to be forgotten and that all of my personal data is deleted from verification records maintained by the university about the study. I understand that this means that only those data identifying me will be deleted.	

Your name is required to verify that you have withdrawn your data from the study as specified above. In the case of (3), above, we will need to retain this form until.....

It may be necessary to share this information with internal examiners, external examiners, and / or journal editors for the purposes of verification of findings and tracing results of studies to the raw data used.

This form will be stored securely until ....., when it will be destroyed, and will not be shared with anyone else.

Signature of participant:	Date:
Signature of person who will ensure that the stated data have been deleted:	Date: