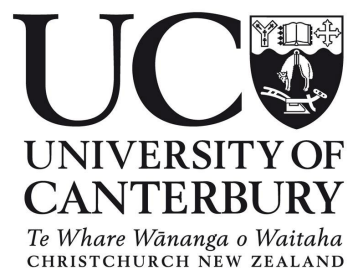


## The HIT Lab NZ

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## Project Information Sheet for Participants

**Project Title:** Human Augmentation for Rhythm Skill Acquisition in Elite Sport.

**Primary Researcher:** Md Tanvir Hossain, Human Interface Technology Lab NZ, Faculty of Engineering, University of Canterbury.

### Research Team Members:

- Professor Stephan Lukosch, Human Interface Technology Lab NZ, Faculty of Engineering, University of Canterbury.
- Professor Robert Lindeman, Human Interface Technology Lab NZ, Faculty of Engineering, University of Canterbury.
- Matt Ingram, Athlete Performance Support, High Performance Sport New Zealand.

### Contact Information:

- Md Tanvir Hossain: [mdtanvir.hossain@pg.canterbury.ac.nz](mailto:mdtanvir.hossain@pg.canterbury.ac.nz)
- Professor Stephan Lukosch: [stephan.lukosch@canterbury.ac.nz](mailto:stephan.lukosch@canterbury.ac.nz)
- Professor Rob Lindeman: [rob.lindeman@canterbury.ac.nz](mailto:rob.lindeman@canterbury.ac.nz)
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### Kia ora,

You are invited to participate in a research study investigating the use of technology to enhance rhythm training in sport. This study is being conducted by Md Tanvir Hossain, a PhD candidate from the University of Canterbury (UC), in collaboration with High Performance Sport New Zealand (HPSNZ). The study is being carried out as a requirement for Doctoral research.

### What is the purpose of this research?

This research aims to investigate how technology can be used to augment training and coaching practices to help athletes acquire rhythm skills. Our goal is to develop and evaluate a system that uses wearable sensors to provide runners with immediate, real-time audio feedback on their movement rhythm, complementing the expert feedback provided by their coach.

### Funding and Involvement of HPSNZ

This study is being funded by High Performance Sport New Zealand (HPSNZ), the official elite sporting body of New Zealand. HPSNZ will be involved in most of the stages throughout the entirety of this research work. They are the central part of this endeavour. As part of our

collaboration, anonymized and aggregated data, such as summary reports and key insights, will be shared with HPSNZ.

### **Why have you received this invitation?**

You have been invited to participate because you are a recreational runner who regularly trains with a coach, or you are a coach of such an athlete. Your participation, as a runner-coach pair, is highly valued as your insights and experiences are essential to the success of this project. Your participation is voluntary. If you decide not to participate, there will be no consequences. Your decision will not affect your relationship with the UC, HPSNZ, or any member of the research team. Please note that participation requires that you are 18 years of age or older.

### **What is involved in participating?**

If you choose to take part, you and your coach will participate together in within-subject study consisting of three separate sessions over three different days.

- **Session 1: Baseline Data Capture (Approx. 1 hour):**
  - You will be asked to perform 5-10 repetitions of a moderate-effort 60m 'stride out' run while wearing small, unobtrusive motion sensors on several parts of your body. After each run, you and your coach will be asked to rate the rhythm of your performance and explain your reasoning. This brief verbal feedback will be audio-recorded.
- **Session 2: Feedback Selection Session (Approx. 1 hour):**
  - We will briefly show you and your coach the final 'Target Pattern' that was selected and validated by your coach via email beforehand. You will then perform runs while listening to 5-7 pre-designed audio feedback options. You and your coach will be asked to provide feedback and rankings on these sounds to help us identify the most effective designs overall. The discussion providing this feedback will be audio-recorded.
- **Session 3: In-Situ Feedback Evaluation (Approx. 1 hour):**
  - The top-ranked audio feedback methods will be tested in a real-world training context. You will be asked to perform runs with the goal of altering your cadence (steps per minute) based on the audio cues. Your coach will observe your response to the feedback, and a debriefing interview will be conducted at the end to discuss your experience. This interview will be audio-recorded to accurately capture your insights.

### **Are there any potential benefits from taking part in this research?**

A potential benefit is that you will gain unique, data-driven insights based on your own 'Rhythm Profile' and the effectiveness of different sonified feedback methods. This personalized information is directly applicable to your training and coaching practices and may improve your performance. Additionally, your participation will contribute to the development of innovative training methods in elite sports.

### **Are there any potential risks involved in this research?**

The risks of physical harm are no higher than what you might experience in everyday training. The running task is a moderate-effort 'stride out' designed for safety. To mitigate any perceived social pressure to participate, the recruitment is handled by HPSNZ, and you are free to decline or withdraw at any time without consequence.

### **What if you change your mind during or after the study?**

You are free to withdraw at any time without any consequences. You can let the researcher know at any point before, during, or after the study. Any information you have provided up to that point

will be removed from the data set if it is still possible. You always own your data and can ask for it to be deleted at any point.

### **What will happen to the information you provide?**

All data will be confidential. To ensure your identity is not known to anyone outside the research team, we will keep your signed consent form in files separate from your observation results. Your identity will not be shared with anyone outside the research team. All study data will be stored in password-protected files on the University of Canterbury computer network or in lockable cabinets in lockable offices. All data will be destroyed ten years after the completion of the study/publication of the study.

As part of the collaboration with HPSNZ, anonymized data will be shared with HPSNZ. This includes aggregated concepts, key ideas discovered during the research, summary reports, and other synthesized findings. No personally identifiable information will be shared, and all shared data will be presented in a way that protects participant confidentiality.

### **Will the results of the study be published?**

The results of this research will be published in a Doctoral thesis, which will be available to the general public through the UC library. Results may also be published in peer-reviewed academic journals and presented during conferences or seminars to wider professional and academic communities. You will not be identifiable in any publication. However, HPSNZ may be identifiable or identified in the research outputs. We would also like to use participant quotes in the research outputs, with your permission.

### **Use of AI Transcription Service**

A local (offline) AI transcription system will be used to transcribe the audio recordings of the interviews to ensure full privacy of the data. The data will not be uploaded to third-party servers overseas and will not be used for any other purposes other than this research. If the need arises, we will make use of Microsoft Teams, Word, or Copilot for AI transcription. Note that Microsoft do not share this information with any third parties, nor do they use the data to train their algorithms. The audio recordings will be deleted immediately after the transcription is complete and verified. You will be asked to provide specific consent for the use of an AI transcription service on the consent form.

### **Who can you contact if you have any questions or concerns?**

If you have any questions about the research, please contact:

- Md Tanvir Hossain: [mdtanvir.hossain@pg.canterbury.ac.nz](mailto:mdtanvir.hossain@pg.canterbury.ac.nz)
- Professor Stephan Lukosch: [stephan.lukosch@canterbury.ac.nz](mailto:stephan.lukosch@canterbury.ac.nz)

This study has been reviewed and approved by the University of Canterbury Human Research Ethics Committee (HREC). If you have concerns or complaints about this research, please contact the Chair of the HREC at [human-ethics@canterbury.ac.nz](mailto:human-ethics@canterbury.ac.nz).

### **What happens next?**

Please review the consent form. If you would like to participate, please sign and return the consent form to the researcher.