

# Participant Information Sheet & Consent Form

**Study Title:** Making Memory Visible: Understanding Performance Reasoning in C++ Learners

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## 1. Introduction

You are invited to take part in a research study that explores how students understand performance and memory behaviour in C++ programs. Before deciding whether to participate, it is important that you understand why the research is being conducted and what it will involve.

Please take time to read the following information carefully.

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## 2. Purpose of the Study

The purpose of this study is to investigate how making low-level system behaviour (such as memory layout and access patterns) more observable affects students' ability to reason about program performance.

The results of this study may be used for:

- Academic research publications
  - Educational research conferences (e.g. SIGCSE)
  - Improving teaching materials and tools
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## 3. Why You Have Been Invited

You have been invited because you are a student with some prior experience in C++ programming. You do not need to be an expert in performance optimisation to take part.

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## **4. What Participation Involves**

If you agree to participate, you will be asked to:

- Complete a small number of C++ programming and analysis tasks
- Make predictions about program performance
- Run provided programs and observe results
- Answer short written questions about your reasoning

The total time commitment is expected to be approximately **90 minutes**.

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## **5. Voluntary Participation**

Your participation in this study is **entirely voluntary**.

- You may choose not to take part
  - You may withdraw at any time without giving a reason
  - Withdrawing will have **no negative consequences**
  - Participation or non-participation will **not affect your grades, assessment, or standing**
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## **6. Right to Withdraw**

You may withdraw from the study at any point:

- During the session
- After completing the tasks
- Before data analysis begins

If you choose to withdraw, any data collected from you will be deleted and not used in the study, provided it can still be identified.

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## **7. Risks and Discomforts**

This study involves **minimal risk**.

- Tasks are similar to standard educational programming activities
- Some tasks may be intellectually challenging, but you may skip any question you are uncomfortable answering

No deceptive practices are used.

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## **8. Benefits**

While there may be no direct personal benefit, participation may help you:

- Develop a better understanding of memory and performance concepts
- Gain experience with research-informed educational tools

The broader benefit is contributing to improved teaching practices in systems programming.

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## **9. Anonymity and Confidentiality**

Your privacy is very important.

- No personally identifiable information will be collected
- Your name will not appear in any publication or report
- Data will be anonymised before analysis
- Results will be reported only in aggregated form

Any free-text responses will be reviewed to ensure they cannot be linked back to you.

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## **10. Data Handling and Storage**

- Data will be stored securely
  - Only the researcher(s) will have access to raw data
  - Data may be retained for research and publication purposes
  - Data will be handled in accordance with applicable data protection regulations
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## **11. Use of Results**

The results of this study may be published in academic papers or presented at conferences.

No individual participant will be identifiable in any publication.

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## **12. Questions or Concerns**

If you have any questions about the study or your participation, please contact:

**Chris Goodings**

Email: goodingscdev@gmail.com

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## **Consent Statement**

Please read the statements below and indicate your agreement.

- I have read and understood the information provided above
- I understand the purpose and nature of the study
- I understand that my participation is voluntary
- I understand that I may withdraw at any time without penalty
- I understand that my responses will be anonymous
- I consent to the use of my anonymised data for research purposes

**I voluntarily agree to take part in this study.**

Participant Signature: \_\_\_\_\_

Date: \_\_\_\_\_