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Participant Information Sheet

Researcher:

My name is Abhaas Goyal and I am an undergraduate student currently doing my Honours year at the Australian National University. My current degree is Bachelor of Advanced Computing (Honours) in the School of Computing, a subsidiary of the College of Engineering and Computer Science.

Project Title: Comparative Study of Traditional versus Capability-Based Module Systems for Modern Programming Languages

General Outline of the Project:

- **Description and Methodology:** The goal of the project is to compare programmer productivity, security of the design, extensibility of packages, and other factors when solving problems in programming languages. In particular, we want to find out whether modules systems/packages having the design of "capabilities" provide advantages when compared with alternatives. To solve this, we would be designing a set of tasks that can be given to experienced software engineers that will involve designing a small product architecture, and then attempt to break its security. We will ask one group to solve these using a language with support for modules and object capabilities and the other group to use a more traditional language.

- **Participants:** I intend to interview 10-15 senior undergraduate students and researchers at the Australian National University, or in some cases other university students in Australia. They would be having a variety of backgrounds and have had relevant experiences in software engineering development. The participants will be recruited through various methods, such as via personal and professional connections, face-to-face interactions with various club members related to Computer Science, and an expression of interest form via online channels (Google Docs) through online publicity in places such as CSSA Discord or ANU Sub-Reddit.

- **Use of Data and Feedback:** The data will be used for my Honours thesis. It would also be potentially used to publish peer-reviewed published articles and conference presentations. A summary of the results will be made available at https://drive.google.com/drive/folders/1_H88qgyUhuOWGcYGls4uKNGeYgtVmLNl

Participant Involvement:

- **Voluntary Participation & Withdrawal:** Your participation in this research is voluntary, and you may decline to take part or withdraw from the research without providing an explanation at any time until the work is prepared for publication. Within the research, you may also decline to answer any question. If you withdraw, the data you have provided prior to withdrawal will be destroyed and not used. you can also refuse to answer any questions asked in the interview.

- **What does participation in the research entail?** You are invited to take part in an in-person interview with me about solving a problem in a programming language with certain requirements, and then have to break the security of the written program. With your consent, I will record the interview (while screen-sharing) so that I can accurately analyze it, and the recordings will be destroyed after analysis.

Australian National University

During the interview, I may ask for personal information about your previous experience in software development, your domain of expertise, and your current role. Access to this information will only be with me and my supervisors, however, an aggregated version of this could be published.

- **Location and Duration:** For preparation, I would be providing you with a list of programming language resources to study which are relevant for the interview. Interviews are expected to last about an hour and a half, and will be conducted in person at one of the IT labs with the necessary environment setup. I may contact you for another one-hour interview if I would like to follow up on anything from the first interview.

- **Risks:** The research carries little risk, although you may feel uncomfortable or distressed if you have had negative experiences with programming interviews before. There is also a risk that despite my efforts to keep your identity confidential, you may be identified through the stories that you tell me, and so you should not tell me anything that would incriminate you or cause others to take an unfavorable view of you.

- **Benefits:** It is unlikely that you will personally benefit from participation in this research. However, the work will improve the understanding of designing secure programming languages, which in turn will have broad benefits in terms of writing better software in terms of programmer productivity, security, and extensibility.

Confidentiality:

We will keep your identity confidential as far as allowed by law, unless you elect to be named within the research. Access to the data you provide will be restricted to the research team, and identifying details will be stored separately from the rest of the research data. Published results will only be reported in aggregate, and you will not be identifiable within published outputs unless you have elected otherwise (no attribution).

Privacy Notice:

In collecting your personal information for this research, the ANU must comply with the Privacy Act 1988. The ANU Privacy Policy is available at https://policies.anu.edu.au/ppl/document/ANUP_010007 and it contains information about how a person can:

- Access or seek correction to their personal information;
- Complain about a breach of an Australian Privacy Principle by ANU, and how ANU will handle the complaint.

Data Storage:

- **Where:** The data will be securely stored on password-protected cloud infrastructure in the School of Computing at the Australian National University and on my local hard drive for backup.
- **How long:** All research data will be retained and securely stored for at least one year following the Honours thesis arising from the research.
- **Handling of Data following the required storage period:** After the storage period, all identifying details will be removed from the data and the non-identified data will be archived at the Australian Data Archive (www.ada.edu.au) for use in later research, including potentially by other researchers.

Queries and Concerns:

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- **Contact Details for More Information:** Any requests for information or queries regarding the study participants should be directed to abhaas.goyal@anu.edu.au (+61 470 696 380) or my primary supervisor Dr. Alex Potanin (alex.potanin@anu.edu.au).

Ethics Committee Clearance:

The ethical aspects of this research have been approved by the ANU Human Research Ethics Committee (Protocol 2022/665). If you have any concerns or complaints about how this research has been conducted, please contact:

Ethics Manager
The ANU Human Research Ethics Committee
The Australian National University
Telephone: +61 2 6125 3427
Email: Human.Ethics.Officer@anu.edu.au