Replicating studies with latency: How does latency influence the outcomes of user studies?

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Abstract

The replication crisis in the field of psychology highlights the frequent failure to reproduce findings from earlier studies, raising concerns about the reliability of scientific results. Amongst various contributing factors, latency in computer-based experiments plays a significant role. This delay affects the temporal accuracy of the experimental measurements and makes it difficult to replicate studies and results. For this reason, we replicate a psychological reaction time study using a continuous version of the Simon task to model the temporal decision-making process. Our paper examines how system latency affects mouse movement trajectories under two conditions: low latency (10ms) and higher latency (80ms). The effects of the original study were successfully replicated, matching the found effects regarding the simon-effect as well as effects of the previous trial on the current one. Concerning the effects of latency on reaction time, mouse trajectory and mouse curvature significant differences were found between the two latency conditions, indicating the need for external chronometry and stricter requirements for measuring response times in computer-based studies.

1. Introduction

2. Related Work

2.1. Replication crisis

2.2. Latency

2.3. Simon Task

2.4. psychol. studies wih mouse movement and reaction time

2.5. summary related work

3. Simulation

- Zusammenfassen wie wir unsere Simulation mit dem normalen simon task gestaltet haben
- beschreiben dass wir nichts herausgefunden haben und uns daher die kontinuierliche Version ansehen

4. Study design

4.1. Experiment

- experiment im allgemeinen beschreiben

4.2. Method

- participants
- apparatus
- procedure
- data preprocessing