Bot or Not: Detecting Bots in Online Multiplayer Video Games through User Input

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Introduction

Botting in online gaming has been an issue for the industry ever since its inception. A bot will allow an illegitimate player to collect resources or gain experience automatically without interacting with the game. If botting is prevalent in a video game, the experience that legitimate players have with the game is spoiled as they can feel frustrated or cheated.

The goal of this research is to determine how input from a bot and human differ and then determine if this information can be used to develop a metric that game developers can use to detect botting in their video games.

Hypothesis

User input can help game developers determine if a player controlled character in a video game is a human or a bot.

Methodology

The video game used in this study is an MMORPG called Ashen Empires. A keylogger was then developed in C++ to gather the appropriate data. The bot used was a simple macro created using JitBit Macro Recorder.

The test subjects and bot were then asked to craft 30 cloth within Ashen Empires while the keylogger recorded data.

Collected Data:

- Keystrokes
- Mouse clicks
- Time interval between each keystroke and each mouse click

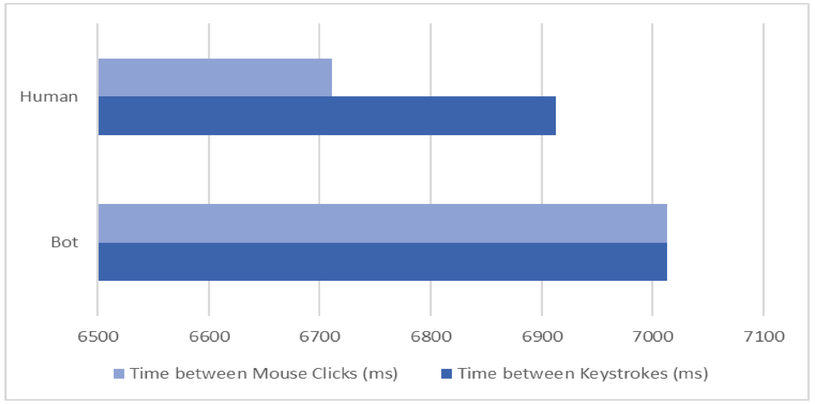

Figure 1: Graph of time intervals between keystrokes and mouse clicks for bots and humans.

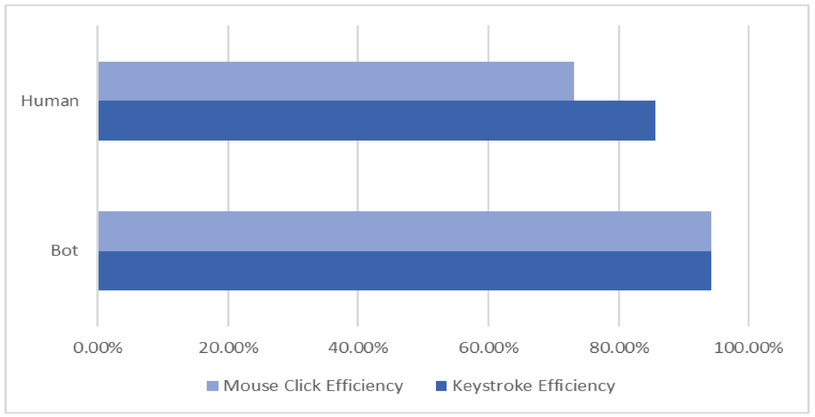

Figure 2: Graph of efficiency of keystrokes and mouse clicks; total amount of actions versus actual output.

Results

Test results yielded that, on average, each human performed 35 keystrokes and 41 mouse clicks on average, whereas the bot performed 32 keystrokes and 32 mouse clicks on average. We also found that the average time between keystrokes for human subjects was 6,727ms and the time between each mouse click was 6,530ms, whereas the bot had an average time between keystrokes and mouse clicks of 6,824ms.

Analysis

From our data, it is possible to compute the efficiency of each test subjects keystrokes. The human subjects yielded a keystroke efficiency of 85.71% and a mouse click efficiency of 73.17%, whereas the bot yielded a keystroke and mouse click efficiency of 94.16%, this is displayed in Figure 2.

It is also possible to compute the distance between the bot and the human. This will use the gathered data to determine how different a bot is from a human. The average distance between a human and a bot is 11,168.304.

Conclusion

The behavior of inputs between a human and a bot are different and therefore the collected data may be useful in detecting bots within video games. Additional study would be directed at generating an algorithm that could detect bots, as well as performing further testing on detecting more complex bots.

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