# Implementation Of Random Number Generation Methods Inside Video Games With Regards To Cost


## Abstract

We will be researching current methods that pseudo-random numbers and true random numbers are generated as well as analyzing them in the context of implementing random numbers in video games. We will carry out this research because most video games require a random number at some point, depending on the application either a pseudorandom or true random number is required, some examples of where a true random number generator would be preferable over a pseudo-random number generator include but not limited to loot boxes / Gacha, wind simulations and procedural generation. We will do this by experimenting with a multitude of various methods and analyzing their results in the context of video games taking into account things such as performance, implementation difficulty, cost, security and speed of data collection. We will showcase the findings that we have accumulated through our testing in a project to showcase the pros and cons of all the methods we found.


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## What Is Your Research Problem Statement?

The purpose of this research is to find the best way to generate random numbers that can be implemented to work in the context of video games in regards to cost and security.

## Why Your Research Is Important?

Generating true random numbers in video games is important as pseudo-random numbers can be predicted. Our motivation for this research is to find a cost-effective way of generating true random numbers that can be integrated with games at a low cost then it could influence how games create random numbers in the future.

# What Is The Existing Research Literature In The Area?

There is a lot of existing research in areas closely surrounding the topic from generating pseudo-random numbers using computer science methods, using entropy in thermodynamics or using a beam splitter in quantum mechanics to generate true random numbers. So wherever we look there is no shortage of existing papers for us to refer to some example include but are not limited to the following:

- Cryptology: Perfect Random Generators
- Q is for Quantum by Terry Rudol
- How to Turn a Quantum Computer Into the Ultimate Randomness Generator
- Analysis of the Linux Random Number Generator
- Generating random binary data from Geiger counters

# What is Your Proposed Research Methodology?

We will do data collection by making a unity project and generating random numbers using various methods and visually display so it can be easily shown the data we collect from doing this will be analyzed against multiple conditions including but not limited to: The price of implementation, security, processing power, speed of seed generator and availability. From this analysis, we will determine a suitable solution for generating the most secure, fast, reliable and cost-effective random number generator.

# What Resources Will You Need To Carry Out The Research?

To carry out our research we will need to retrieve resources the following resources:

- Research articles and books
- Sensors to convert real-world data into a useable format
- A microcontroller to convert the sensor data into a format to be used on a computer or server

- At least one computer or server capable of running and processing the amount of information generated from our research
- Funding to purchase any equipment

# Will Your Research Need Approval From An Ethics Committee?

Due to the fact that we will not be collecting, processing, disposing or storing any information that would be viewed as a potential ethical issue we will not require approval from an ethics committee.

# References

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