



Strong Entropy Sources for Randomness Extractors

Project documentation

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Abstract

This is an abstract.

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1 General

1.1 Purpose

The purpose of this paper is to study and document entropy sources used by pseudo-random number generators. Their strengths and weaknesses is evaluated and compared, to ultimately decide on which sources are the strongest.

1.2 Audience

This document is written with the intent to explore how entropy sources are chosen and evaluted, hence a fundamental knowledge about computer science is required.

1.3 Revision History

Version	Date	Name	Comment
0.1	March 21, 2020	Matthias Thomann	Initial draft

2 Entropy Sources

2.1 Formal Defintion

2.2 Entropy Types

2.2.1 Shannon-Entropy

2.2.2 Hartley-Entropy

2.2.3 Min-Entropy

2.3 Validation

2.3.1 Validation Process

2.3.2 Health Tests

3 Randomness Extraction

3.1 Formal Defintion

3.2 Importance in Cryptography

3.3 Random Seed

3.4 Types of Extractors

3.4.1 Strong Extractors

3.4.2 Explicit Extractors

3.5 Existing Examples

3.5.1 Von Neumann Extractor

3.5.2 Chaos Machine

3.5.3 Cryptographic Hash Functions

4 Random Number Generation

4.1 Pseudo-Random

4.2 True Random

GPU

Glossary

GPU Graphics Processing Unit. 3

References

- [1] *Github: Code repository*. [Online]. Available: <https://github.com/mth0348/info-seminar>.

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