

**IMPLEMENTASI DISCRETE PROBABILITY DISTRIBUTION PADA
VIDEO GAMES FISHING SIMULATION MENGGUNAKAN KEACAKAN
METODE LINEAR CONGRUENTIAL**

ABSTRAK

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Angka acak *uniform distribution* dibutuhkan pada beberapa algoritma dan implementasi praktis seperti *nonce generation*, *shuffling*, dan beberapa implementasi *probability* pada *video games*. Penelitian ini bertujuan untuk mengetahui proses dan hasil dari implementasi *probability distribution* menggunakan keacakan metode *linear congruential generator (LCG)*. Penelitian ini ditujukan secara khusus untuk pengembang *game* yang memerlukan optimasi akurasi dan ketepatan dari *probability distribution* pada beberapa *game mechanic*. Dengan melakukan kombinasi antara algoritma LCG, Hull-Dobell Theorem, dan *discrete probability distribution* maka didapatkanlah sebuah mekanisme yang dapat menghasilkan model probabilitas yang tepat dan akurat. Jenis *discrete probability distribution* yang diteliti adalah *uniform probability distribution* dan *frequency probability distribution*. Sampel data penelitian diambil dari hasil eksperimen yaitu 100.000 *record* data dari total 265.302 *record* data yang terkumpul untuk diuji menggunakan sebuah metode pengujian. Hasil pengujian menggunakan *Pearson's Chi-Squared Goodness of Fit test* antara hasil observasi dengan data model pada tahap desain menghasilkan skor *chi-square* $\chi^2 = 0$ atau mirip satu sama lain.

Kata kunci : *probability distribution, developmental research, statistical test, linear congruential, simulation games, chi-square*

**IMPLEMENTATION OF DISCRETE PROBABILITY DISTRIBUTION
ON FISHING SIMULATION VIDEO GAMES USING RANDOMNESS OF
LINEAR CONGRUENTIAL METHOD**

ABSTRACT

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Uniform distribution random numbers are required on some algorithms and practical implementations such as nonce generation, shuffling, and some probability implementations in video games. This study aims to determine the process and results of probability distribution implementation using the randomness of linear congruential generator (LCG) method. This research is aimed specifically at game developers who require optimization of accuracy and precision of probability distribution in some game mechanics. By combining the LCG algorithm, Hull-Dobell Theorem, and discrete probability distribution, we find a mechanism that can produce a precise and accurate probability model. The types of discrete probability distribution studied are uniform probability distribution and frequency probability distribution. The sample of research data is taken from the experimental result that is 100.000 record data from total 265.302 record data collected and to be tested using a test method. Test results using Pearson's Chi-Squared Goodness of Fit test between observations and model data at the design stage resulted in a chi-square score $\chi^2 = 0$ or similar to each other.

Keywords : probability distribution, developmental research, statistical test, linear congruential, simulation games, chi-square