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Using GPU Simulation to Accurately Fit to the Power-Law Distribution

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This article describes a methodology for fitting experimental data to the discrete power-law distribution and provides the results of a detailed simulation exercise used to calculate accurate cutoff values used to assess the fit to a power-law distribution when using the maximum likelihood estimation for the exponent of the distribution. Using massively parallel programming computing, we were able to accelerate by a factor of 60 the computational time required for these calculations across a range of parameters and construct a series of detailed tables containing the test values to be used in a Kolmogorov-Smirnov goodness-of-fit test, allowing for an accurate assessment of the power-law fit from empirical data.

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