

# Automatic R-script generation for Monte Carlo Simulations

Rüdiger Kessel<sup>1,\*</sup>

1. National Institute of Standards and Technology, 100 Bureau Drive, Gaithersburg, MD 20899  
\* Contact author: ruediger.kessel@nist.gov

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The Supplement 1 to the guide of the expression of uncertainty in measurement (BIPM 2006) describes how the Monte Carlo method can be used to evaluate the uncertainty of measurement. We have developed a method to automatically generate *R*-scripts for arbitrary measurement problems which carry out such simulations. Based on a text file containing a description of the measurement problem, an *R*-script is generated and executed without user interaction.

We discuss different aspects of our approach to automate the generation of *R* scripts including passing command line parameters, determining the execution order and data transfer between programs. The automatic script generation is demonstrated in practice for some examples.

The automatic *R*-script generation was developed to support a framework to validate other simulation software. We discuss how *R* can support this framework.

Automatic *R*-script generation can also be used in commercial applications. Since it is clearly defined which part of the system is open-source and which part is proprietary, it allows the integration of both worlds to improve usability without license violation.

## References

BIPM (2006). *Expression of Uncertainty in Measurement Supplement 1: Numerical Methods for the Propagation of Distributions*, JCGM Working Group of the Expression of Uncertainty in Measurement