

A calculator of some special mathematical functions

Sara Lazić

*School of Electrical Engineering, University of Belgrade, Bulevar Kralja Aleksandra 73, Beograd 11120, Serbia
e-mail: sara.lazic@outlook.com, ls213238m@student.etf.bg.ac.rs*

Bratislav Iričanin

*School of Electrical Engineering, University of Belgrade, Bulevar Kralja Aleksandra 73, Beograd 11120, Serbia
e-mail: iricanin@etf.rs*

Abstract. This paper presents the implementation of a calculator of certain special mathematical functions in the form of an efficient web application with a simple and intuitive GUI (graphical user interface). The objective of this application is to enable accurate numerical approximations of the most frequently used special mathematical functions in engineering and science, eliminating the necessity to acquire additional notational knowledge or programming languages syntax experience. The investigation can be divided into three larger units. The initial section offers a theoretical introduction – the functions whose approximations are implemented are defined and the formulas used for their approximation are given. For the time being, this application provides approximations for the following special mathematical functions: Bessel functions of the first kind, gamma and beta functions, and some orthogonal polynomials – Legendre, Laguerre, Hermite (physicist’s and probabilistic) polynomials, Chebyshev polynomials of the first and the second kind, as well as Jacobi polynomials. The middle section presents a description of the computer implementation – an overview of the used technology and implemented algorithms, while final section includes an overview of the application and discussion of the solution, as well as a comparison with existing software which provides same features as the subject application. At the end, it is pointed on improvements regarding existing software, as well as on development directions.

Keywords: special functions, orthogonal polynomials, gamma function, numerical approximations, numerical calculator