
Summary: Recently the Legendre and other Sturm-Liouville (SL) polynomials were found as eigenvectors of certain matrices. However, the proposed algorithms are computationally incomplete and do not lead to general formulas to calculate the coefficients of SL polynomials of any order. In this paper, we complete the algorithms based on a matrix-eigenvector method, which can be used to compute SL polynomials of any order. This includes Legendre, Hermite, Laguerre, and Chebyshev polynomials.

MSC:

65F15 Numerical computation of eigenvalues and eigenvectors of matrices
34B24 Sturm-Liouville theory

Keywords:
back-substitution; eigenvalues; eigenvectors; self-adjoint operators; Sturm-Liouville equations; upper triangular matrices

Full Text: DOI

References:

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.