Generalizations of Weighted Hermite–Hadamard and Fejér Type Inequalities and Applications

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Abstract

Weighted Hermite–Hadamard inequalities represent a fundamental tool in the study of convex functions and integral inequalities.

In recent years, considerable attention has been devoted to refining and extending Hermite–Hadamard and Fejér type inequalities, particularly in the context of weighted settings and higher-order convexity, due to their important role in numerical analysis and approximation theory.

The main aim of this talk is to present new generalizations of weighted Hermite–Hadamard and Fejér type inequalities for higher–order convex functions. Our approach is based on the use of weighted Montgomery identities and related integral representations, which provide a unified and systematic method for deriving extensions and refinements of known results.

Furthermore, we discuss applications of these inequalities to the estimation of errors in quadrature formulas. Special cases corresponding to different choices of weight functions will also be considered.

The presented results are based on joint work with J. Pečarić, S. Kovač, J. Barić, and Lj. Kvesić.

Keywords: Hermite–Hadamard inequalities, Fejér inequalities, Montgomery identity, higher order convex functions

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