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Hamzeh Agahi, Milad Yadollahzadeh

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A generalization of H-H f -divergence

Hamzeh Agahi^{a*} and Milad Yadollahzadeh^{b†}

^a*Department of Mathematics, Faculty of Basic Science,*

Babol Noshirvani University of Technology, Shariati Ave., Babol 47148-71167, Iran

^b*Department of Mathematics, Faculty of Mathematical Sciences,*

University of Mazandaran, Babolsar 47416-95447, Iran

Abstract

In optimization theory, the discrimination between two probability distributions is an impotent problem. In 1991, Lin [IEEE Transactions on Information Theory, 37(1) 1991] introduced a novel class of information-theoretic divergence measures based on the Shannon entropy. As a generalization of Lin's divergence, a new divergence, called Hermite-Hadamard (HH) f -divergence, based on Lin's method of constructing the divergence was introduced by Shioya and Da-te in 1995. In this paper, we expand the applicability of HH f -divergence by combining the properties of fractional calculus with HH f -divergence, and then introduce the concept of some fractional HH f -divergences which are generalizations of the HH f -divergence. Then, some inequalities related to fractional HH f -divergence are proposed.

Keywords: f -divergence; Fractional HH f -divergence; inequalities; Information theory

1 Introduction

Optimization theory plays an important rule in numerous applications in applied mathematics, engineering and statistics [2, 3, 4, 5, 6]. The discrimination (distance) between two probability distributions is an impotent subject

*Corresponding author. h_agahi@nit.ac.ir

†m.yadollahzadeh@yahoo.com

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