

**Abstract:** I will first give a short background of Hardy-type inequalities and present a surprising proof via convexity we recently found. After that I demonstrate how this simple technique can be used to prove the most common power weighted variants of Hardy's inequality and, moreover, that these variants are in a sense equivalent. I continue by shortly describing some of my own research results from the last years e.g. presented in my recent books [1] and [2] and Lecture Notes [3] from P.L. Lions Seminar 2015. A number of open questions will be raised; some of them can be very good to be used as starting points for new PhD projects.

[1] A.Kufner, L.E. Persson and N. Samko, *Weighted Inequalities of Hardy type*, World Scientific, Second edition, New Jersey-London-etc., 2017 (459+xx pp.)

[2] C.P Niculescu and L.E. Persson, *Convex Functions and their Applications. A contemporary Approach*, CMS Books in Mathematics, Springer, Second edition, Berlin-Heidelberg-etc., 2018 (415+xvii pp.)

[3] L.E. Persson, *Lecture Notes*, College de France, Pierre-Louis Lions' Seminar, November 2015 (79 pp.)