

SOME OSTROWSKI TYPE INEQUALITIES FOR p -CONVEX FUNCTIONS VIA GENERALIZED FRACTIONAL INTEGRALS

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Abstract. In this paper, some new Ostrowski type inequalities for generalized fractional integrals are obtained. An identity via generalized fractional integrals and differentiable mappings, together with a new concept are used.

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REFERENCES

- [1] K. S. MILLER AND B. ROSS, *An Introduction to the Fractional Calculus and Differential Equations*, John Wiley, New York, 1993.
- [2] S. G. SAMKO, A. A. KILBAS AND O. I. MARICHEV, *Fractional Integrals and Derivatives, Theory and Applications*, Gordon and Breach, Yverdon, 1993.
- [3] I. PODLUBNY, *Fractional Differential Equations*, Academic Press, San Diego, 1999.
- [4] A. A. KILBAS, H. M. SRIVASTAVA AND J. J. TRUJILLO, *Theory and Applications of Fractional Differential Equations*, North-Holland Mathematics Studies, 204. Elsevier Science B.V., Amsterdam, 2006.
- [5] V. LAKSHMIKANTHAM, S. LEELA AND J. VASUNDHARA DEVI, *Theory of Fractional Dynamic Systems*, Cambridge Academic Publishers, Cambridge, 2009.
- [6] D. BALEANU, K. DIETHELM, E. SCALAS AND J. J. TRUJILLO, *Fractional calculus models and numerical methods. Series on Complexity, Nonlinearity and Chaos*, World Scientific, Boston, 2012.
- [7] K. DIETHELM, *The analysis of fractional differential equations. An application-oriented exposition using differential operators of Caputo type*, Lecture Notes in Mathematics 2004, Springer, 2010.
- [8] A. GUEZANE-LAKOUD AND R. KHALDI, *Solvability of a three-point fractional nonlinear boundary value problem*, Differ. Equ. Dyn. Syst. **20** (2012), 395–403.
- [9] A. GUEZANE-LAKOUD AND R. KHALDI,
- [9] E. KAUFMANN, *Existence and nonexistence of positive solutions for a nonlinear fractional boundary value problem*, Discrete Contin. Dyn. Syst., (2009), Suppl., 416–423.
- [10] J. WANG, H. XIANG AND Z. LIU, *Positive solution to nonzero boundary values problem for a coupled system of nonlinear fractional differential equations*, Int. J. Differ. Equ. 2010, Article ID 186928, 12 p.
- [11] Z. BAI AND H. LÜ, *Positive solutions for boundary value problem of nonlinear fractional differential equation*, J. Math. Anal. Appl. **311** (2005), 495–505.
- [12] Z. BAI, *On positive solutions of a nonlocal fractional boundary value problem*, Nonlinear Anal. **72** (2010), 916–924.
- [13] W. SUDSUTAD AND J. TARIBOON, *Boundary value problems for fractional differential equations with three-point fractional integral boundary conditions*, Adv. Difference Equ. (2012) **2012:93**.
- [14] S. K. NTOUYAS, *Existence results for nonlocal boundary value problems for fractional differential equations and inclusions with fractional integral boundary conditions*, Disc. Math. Diff. Incl. Contr. Optim. **33** (2013), 17–39.
- [15] W. YANG, *Positive solutions for nonlinear Caputo fractional differential equations with integral boundary conditions*, J. Appl. Math. Comput. DOI 10.1007/s12190-013-0679-8.

- [16] B. AHMAD, S. K. NTOUYAS AND A. ASSOLANI, *Caputo type fractional differential equations with nonlocal Riemann-Liouville integral boundary conditions*, J. Appl. Math. Comput. **41** (2013), 339–350.
- [17] U. N. KATUGAMPOLA, *New Approach to a generalized fractional integral*, Appl. Math. Comput. **218** (2011), 860–865.
- [18] I. ISCAN, *Ostrowski type inequalities for p -convex functions*, New Trends in Mathematical Sciences **4** (2016), 140–150.
- [19] I. ISCAN, *Hermite-Hadamard type inequalities for p -convex functions*, International Journal of Analysis and Applications **11** (2016), 137–145.
- [20] Z. FANG AND R. SHI, *On the (p, h) -convex function and some integral inequalities*, J. Ineq. Appl. (2014), **2014**:45.
- [21] W. LIU, *Ostrowski type fractional integral inequalities for MT-convex functions*, Miskolc Math. Notes **16** (2015), 249–256.
- [22] M. Z. SARIKAYA, *On the Ostrowski type integral inequality*, Acta Math. Univ. Comen. **LXXIX** (2010), 129–134.
- [23] M. Z. SARIKAYA, H. OGUNMEZ, *On new inequalities via Riemann-Liouville fractional integration*, Abstr. Appl. Anal. 2012, 428983 (2012), 10 pp.
- [24] E. SET, *New inequalities of Ostrowski type for mappings whose derivatives are s -convex in the second sense via fractional integrals*, Comput. Math. Appl. **63** (2012), 1147–1154.
- [25] M. Z. SARIKAYA, E. SET, H. YALDIZ AND N. BASAK, *Hermite-Hadamard's inequalities for fractional integrals and related fractional inequalities*, Math. Comput. Modelling **57** (2013), 2403–2407.
- [26] J. WANG, J. DENG AND M. FECKAN, *Exploring s - e -condition and applications to some Ostrowski type inequalities via Hadamard fractional integrals*, Math. Slovaca **64** (2014), 1381–1396.
- [27] A. M. OSTROWSKI, *Über die absolutabweichung einer differentierbaren Funktion von ihren Integralmittelwert*, Comment. Math. Helv. **10** (1938), 226–227.
- [28] D. S. MITRINOVIC, J. E. PECARIC AND A. M. FINK, *Inequalities involving functions and their integrals and derivatives*, Mathematics and its Applications (East European Series), 53, Kluwer Acad. Publ., Dordrecht, 1991.