

COEFFICIENT FUNCTIONAL FOR THE KTH ROOT TRANSFORM OF ANALYTIC FUNCTION AND APPLICATIONS TO FRACTIONAL DERIVATIVES

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Abstract. In the present investigation, the authors introduce certain subclass of analytic function and obtain the sharp upper bounds for the coefficient functional $|b_{2k+1} - vb_{k+1}^2|$ corresponding to the k th root transformation of certain normalized analytic function defined on the unit disk Δ in the complex plane. As an application of the main results, we obtain the Fekete-Szegő inequalities for the function defined by fractional derivatives. Similar problems are investigated for the inverse function of f and for the function $\frac{z}{f(z)}$. Our results generalize and unify the work of earlier researchers in this direction.

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REFERENCES

- [1] O. P. AHUJA AND M. JAHANGIRI, *Fekete-Szegő problem for a unified class of analytic functions*, Panamer. Math. J. **7**, 2 (1997), 67–78.
- [2] R. M. ALI, S. K. LEE, V. RAVICHANDRAN AND S. SUPRAMANIAM, *The Fekete-Szegő coefficient functional for the transforms of analytic functions*, Bull. Iranian Math. Soc. **35**, 2 (2009), 119–142.
- [3] R. M. ALI, V. RAVICHANDRAN AND N. SEERIVASAGAN, *Coefficient bounds for p -valent functions*, Appl. Math. Comput. **187**, 1 (2007), 35–46.
- [4] S. ANNAMALAI, C. RAMACHANDRAN AND G. MURUGUSUNDARAMOORTHY, *Fekete-Szegő coefficient for the Janowski α -spirallike functions in open unit disk*, Int. J. Math. Anal. **8**, 19 (2014), 931–938.
- [5] R. M. EL-ASHWAH, M. K. AOUF AND F. M. ABDULKAREN, *Fekete-Szegő inequality for certain class of analytic function of complex order*, Int. J. Open Problem Complex Anal. **6**, 1 (2014), 12 pages.
- [6] N. E. CHO AND S. OWA, *On the Fekete-Szegő problem for strongly α logarithmic quasi convex functions*, Southeast Asian Bull. Math. **28**, 3 (2004), 421–430.
- [7] J. H. CHOI, Y. C. KIM AND T. SUGAWA, *A general approach to the Fekete-Szegő problem*, J. Math. Soc. Japan **59**, 3 (2007), 707–727.
- [8] M. DARUS AND T. N. SHANMUGAM AND S. SIVASUBRAMANIAN, *Fekete-Szegő inequality for a certain class of analytic functions*, Mathematica **49**, 72 (1) (2007), 29–94.
- [9] M. DARUS AND N. TUNESKI, *On the Fekete-Szegő problem for generalized close-to-convex functions*, Int. Math. J. **4**, 6 (2003), 561–568.
- [10] M. FEKETE AND G. SZEGŐ, *Eine bemerkung über ungerade schlichte funktionen*, J. London Math. Soc. **8**, (1933), 85–89.
- [11] F. R. KEOGH AND E. P. MERKES, *A coefficient inequality for certain classes of analytic functions*, Proc. Amer. Math. Soc. **20**, (1969), 8–12.
- [12] O. S. KWON AND N. E. CHO, *On the Fekete-Szegő problem for certain analytic functions*, J. Korea Soc. Math. Educ. Ser. B Pure Appl. Math. **10**, 4 (2003), 265–271.

- [13] W. MA AND D. MINDA, *A unified treatment of some special classes of univalent functions*, in: Proceeding of the Conference on Complex Analysis, Z. Li, F. Ren, L. Yang and S. Zhang (eds.), Int. Press (1994), 157–169.
- [14] S. S. MILLER AND P. T. MOCANU, *Differential Subordination: Theory and Applications*, Series on Monographs and Textbooks in Pure and Applied Mathematics **225**, Marcel Dekker, New York, 2000.
- [15] S. OWA AND H. M. SRIVASTAVA, *Univalent and starlike generalized hypergeometric functions*, *Canad. J. Math.* **39**, (1987), 1057–1077.
- [16] T. PANIGRAHI AND G. MURUGUSUNDARAMOORTHY, *The Fekete-Szegő inequality for subclass of analytic function of complex order*, *Adv. Stud. Contemp. Math.* **24**, 1 (2014), 67–75.
- [17] C. RAMACHANDRAN, S. SIVASUBRAMANIAN AND H. SILVERMAN, *Certain coefficient bounds for p -valent functions*, *Int. J. Math. Math. Sci.* (2007), doi: 10.1155/2007/46576.
- [18] V. RAVICHANDRAN, M. DARUS, M. H. KHAN AND K. G. SUBRAMANIAN, *Fekete-Szegő inequality for certain class of analytic functions*, *Aust. J. Math. Anal. Appl.* **1**, 2 (2004), 4–7.
- [19] V. RAVICHANDRAN, A. GANGADHARAN AND M. DARUS, *Fekete-Szegő inequality for certain class of Bazillevic functions*, *Far East J. Math. Sci.* **15**, 2 (2004), 171–180.
- [20] R. B. SHARMA, M. HARIPRIYA AND K. SAROJA, *A coefficient functional for the transformations of starlike and convex functions of complex order*, *Gen. Math. Notes* **39**, 2 (2015), 16–30.