



YAMINI . J

Principal Investigator
Department of Mathematics
Government First Grade College
Vijayanagar, Bangalore-560104

REGION OF VARIABILITY OF CERTAIN SUBCLASS OF UNIVALENT FUNCTIONS

MINOR RESEARCH PROJECT - UGC

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ABSTRACT

The project work is devoted to discuss "Region of variability of certain subclass of univalent functions". This work consists of five chapters and references.

To study of the coefficient estimate problem for each of the following Taylor-Maclaurin coefficients a_n for $n \in \mathbb{N} \setminus \{1,2\}$ for several subclasses of Univalent and bi-univalent functions $\mathbb{N} \setminus \{1,2,3, \dots\}$. To study of the Hankel Determinant problems for certain classes univalent functions. Region of variability Recently, Zaprawa solved problems concerning the coefficients of functions in the class of typically real functions associated with Gegenbauer polynomials and determined the estimates of two expressions: $|a_4 - a_2a_3|$ and $|a_2a_4 - a_3^2|$. The second one is known

as the second Hankel determinant. To obtain those bounds, they considered the regions of variability of selected pairs of coefficients for functions in certain class of the typically real functions. This motivates to discuss the coefficient bound problems for certain class of univalent functions defined by Chebyshev polynomials. In 2011, Ponnusamy Saminathan · Vasudevarao Allu , M. Vuorinen to discussed the region of variability for certain class of univalent functions. Motivated by this class we have considered the generalized class of univalent functions defined by subordination and found certain bounds, and second Hankel determinant functional.

Geometrically motivated classes of univalent and bi-univalent functions that have been extensively investigated in the literature are the classes of Bi-Starlike and Bi-Convex functions. Properties of various subclasses of these functions have also been considered in the literature. In this project we discuss in detail several subclasses of bi-starlike and bi-convex functions defined by subordination and considering Chebyshev polynomials, k th root transformation. Further, we introduce and investigate several interesting subclasses of analytic and bi-univalent functions defined in the open unit disk. For functions belonging to the above newly defined classes, we obtain the coefficient estimates on the first two non-sharp Taylor-Maclaurin coefficients $|a_2|$ and $|a_3|$. Further, Hankel determinant problems are considered. The results presented in this project would generalize and improve some recent works. Relevant connections of the results, which are presented in this project, with various other known results are also pointed out. A new line of work has been shown to young researchers those who are working in this line.

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