On The Generalized Fibonacci Matrix Hybrinomials

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Abstract – Complex numbers, hyperbolic numbers, and dual numbers are well-known number systems in the literature. The hybrid numbers, which have significantly increased interest in recent years, are the generalization of complex numbers, hyperbolic numbers, and dual numbers. Until now, many researchers have studied the geometric and physical applications of hybrid numbers and the Fibonacci numbers which arise in the applications of mathematics, computer science, physics, biology, and statistics. In addition, there are many studies on the matrix sequences of the Fibonacci numbers. In this study, we define the generalized Fibonacci matrix hybrinomials with the help of the generalized Fibonacci polynomials. We also provide the Binet formula and generating function of the generalized Fibonacci matrix hybrinomials. Finally, we give some summation formulas with the help of the Binet formula.

Keywords –Fibonacci polynomials, Hybrid numbers, Matrix sequences, Binet formula