
ON FIBONACCI–BERNSTEIN BASIS FUNCTIONS AND THEIR PROPERTIES

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ABSTRACT

In this talk, we introduce the Fibonacci–Bernstein basis functions, a Fibonacci analogue of the classical Bernstein basis [1] built from the Fibonomial coefficients and Golden binomial powers of the Golden (Binet–Fibonacci) calculus [2]; they are closely related to the recently introduced F-Bernstein polynomials [3]. For these basis functions we derive an explicit expansion, a generating function, a Golden derivative formula, and a recurrence relation, and we express the Golden hyperbolic functions of both kinds in terms of them. We then introduce the associated Fibonacci–Bernstein matrix, obtain its factorization through the Fibo–Pascal matrices, and determine its inverse with the help of an auxiliary family of polynomials. Finally, we examine the zeros of these basis functions for a specific degree and plot them.

Keywords Fibonacci–Bernstein basis functions · Golden calculus · Fibonomial coefficients · Golden derivative · Fibonacci–Bernstein matrix

References

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