

[ddesolver] A Maple package for Discrete Differential Equations.

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Discrete differential equations are functional equations relating algebraically a formal series $F(t, u)$ with polynomial coefficients to a "catalytic" variable u , with specialisations of this series with respect to the variable u . Such equations appear in enumerative combinatorics, for example in card enumeration. In 2006, Mireille Bousquet-Mélou and Arnaud Jehanne showed that when these equations are of the fixed point type in F , then F is an algebraic series. In the same article, they proposed a systematic method for calculating the cancellation polynomials of these series. Together with Alin Bostan and Mohab Safey El Din, we have recently designed new efficient algorithms to compute these algebraic witnesses. In this talk, I will present the first Maple package dedicated to solving these DDEs, one of the algorithms on which this package is based, and some practical results.