



DEPARTAMENTO DE ÁLGEBRA



## Seminario de Geometría Algebraica

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## “Budan tables of real univariate polynomials”

**Abstract:** The Budan table of  $f$  collects the signs of the iterated derivative of  $f$ . We revisit the classical Budan-Fourier theorem for a univariate real polynomial  $f$  and establish a new connectivity property of its Budan table. We use this property to characterize the virtual roots of  $f$ , (introduced by González-Vega, Lombardi, Mahé in 1998); they are continuous functions of the coefficients of  $f$ . We also consider a property  $(\mathcal{P})$  of a polynomial  $f$ , which is generically satisfied, it eases the topological-combinatorial description and study of the Budan tables. A natural extension of the information collected by the virtual roots provides alternative representations of  $(\mathcal{P})$ -polynomials; while an attached tree structure allows a finite stratification of the space of  $(\mathcal{P})$ -polynomials. The paper is illustrated with examples and pictures computed with the computer algebra system Maple.

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