

English summaries

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The contribution of Vicent Caselles to the world of mathematics and its application to image processing

In this paper we review the most important contributions of Vicent Caselles to the field of mathematics and their application to the image processing field. The contributions cover a broad panorama ranging, from basic research as is the case of his contributions to the field of non-linear EDPs and the analytical study of the total variation (TV) model to the sphere of the applications in the field of image processing. To some degree, the sections relate to the areas in which the participation was most significant; specifically, to the sphere of basic research part, the contributions to the study of the function of total variation, strongly degenerate quasilinear equations and choked flow equations. With regard to applications in the field of image processing, we have chosen three topics in which Caselles contributed in a very significant way: the detection of contours, the problem of interpolation or “inpainting” and the mathematical formulation of color theory.

Keywords: functional analysis, total variation, non-linear PDEs, image processing, contour detection, inpainting, color theory.

MSC2010 Subject Classification: 68T99, 46Txx, 35K93.

Joan Carles Naranjo

Poncelet in Saratov prison

Poncelet was a soldier in the French army who took part in the Battle of Krasnoï where the Napoleonic troops were defeated in the Russian war. During his stay

as a prisoner in Saratov, based on his recollection of the inspiring lectures of Gaspard Monge at the École Polytechnique, he worked on the foundations of projective geometry. The influence of the work of Poncelet extends throughout the 19th century. Among the results proved by Poncelet in this period the most remarkable is the acclaimed “Poncelet’s porism” which deals with the existence of polygons with vertices in a given conic and edges that are tangents to another fixed conic. In this paper we review certain facts of Poncelet’s life and we set out a notion of one of the demonstrations of the porism.

Keywords: projective geometry, conics, Poncelet’s porism.

MSC2010 Subject Classification: 01A55, 14N05, 14N15.

Xavier Xarles

Primes unveiled

The main aim of this paper is to present in an informal way a probabilistic point of view on the distribution of primes that could explain why some well-known conjectures on the primes are true. We also present some results showing that this approach really captures the actual distribution. At the same time, we introduce some of the most recent results on primes by Green, Tao, Zhang, Maynard and Polymath.

Keywords: primes, zeta function, prime tuples, pseudorandom, Goldbach’s conjecture, De Polignac’s conjecture, Zhang’s theorem.

MSC2010 Subject Classification: 11-02, 11A41, 11P32.
