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English summaries

Anna Cima

Globally attracting equilibrium points

An equilibrium point of a continuous or discrete dynamical system is a global attractor if the orbit of any point tends to the equilibrium when time tends to infinity. In this article we deal with the problem of giving sufficient conditions for an equilibrium point of a dynamical system to be a global attractor. In particular, we deal with continuous and discrete Markus-Yamabe problems and Lasalle conditions. We obtain some affirmative answers to the existence of a global attractor and we find some examples that do not exhibit it. Lastly, we detail a case in which the problem is not solved. The presented results have been obtained in collaboration with Armengol Gasull and Francesc Mañosas, and have been taken from the common articles cited in the bibliography.

Keywords: continuous and discrete dynamical systems, global attractor, Markus-Yamabe conjecture, Jacobian conjecture, linearization theorem.

MSC2010 Subject Classification: 35A24, 37Cxx.

Esther Ibáñez-Marcelo

Introduction to Topological Data Analysis and applications

Topological Data Analysis (TDA) has been increasingly trending in the last ten years. Here we present an introduction based on basic concepts and definitions that allow us to describe the main tools in this recent field where greater importance is given to shape rather than to the metrics. We will see

what persistent homology consists of and how it can be applied in a wide range of scientific fields, such as neuroscience, image recognition and genetics.

Keywords: persistent homology, persistence diagram, barcode, *Mapper*, data analysis.

MSC2010 Subject Classification: 55N31, 62R40, 68T09.

Xavier Tolsa

Rectifiability, square functions and Carleson's ε^2 conjecture

In this paper we review some classical results about rectifiability and other more recent related results, such as Jones' traveling salesman theorem or the solution of Carleson's ε^2 conjecture. To prove these results, the application of new ideas based on harmonic analysis has been essential.

Keywords: rectifiability, tangent, traveling salesman theorem, square functions, Hausdorff measures.

MSC2010 Subject Classification: 28A75, 28A78, 30C85.
