

Discrete Morse theory for multi-filtrations

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Abstract

I will present my joint work with Allili and Brouillette aimed to provide an application-driven extension of the Morse-Forman theory to vector-valued functions. Using concepts of combinatorial topological dynamics studied in recent years, in addition to adapting the main definitions and results of Forman to this multidimensional setting, we establish a more general result regarding the sublevel sets of a multidimensional discrete Morse function and find a set of Morse inequalities specific to such functions.