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Yomdin · Comte

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Tame Geometry with Application in Smooth Analysis

The Morse-Sard theorem is a rather subtle result and the interplay between the high-order analytic structure of the mappings involved and their geometry rarely becomes apparent. The main reason is that the classical Morse-Sard theorem is basically qualitative. This volume gives a proof and also an "explanation" of the quantitative Morse-Sard theorem and related results, beginning with the study of polynomial (or tame) mappings. The quantitative questions, answered by a combination of the methods of real semialgebraic and tame geometry and integral geometry, turn out to be non-trivial and highly productive. The important advantage of this approach is that it allows the separation of the role of high differentiability and that of algebraic geometry in a smooth setting: all the geometrically relevant phenomena appear already for polynomial mappings. The geometric properties obtained are "stable with respect to approximation", and can be imposed on smooth functions via polynomial approximation.

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