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Geometric model theory

Abstract: Geometric model theory studies geometric notions such as (combinatorial) geometries, independence, dimension/rank and measure in general structures, and tries to deduce structural properties from geometric data.

Initially the subject was divided into two parts, structures without order (where basic examples are a pure set, a vector space over a division ring, and algebraically closed fields), and ordered structures (where basic examples are a dense linear order, an ordered vector space over an ordered division ring, and a real closed field). Although results obtained in both parts were similar, the methods used were quite different. However, since the 90s there have increasingly been attempts to unify the two halves, or at least parts of them, and to extend the methods to a wider context (simple, rosy and dependent theories), partially motivated by applications in diophantine geometry or real analysis.

I shall try to give an overview of the main approaches and results in a manner accessible to a non model-theorist.