Concrete geometrical categories

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Categories of affine spaces, affine algebraic sets, projective algebraic sets, semi--algebraic sets, measurable spaces, topological spaces, ordered sets, are examples of concrete geometrical categories while categories of schemes are examples of non concrete geometrical categories. We aim at a classification of concrete geometrical categories. We provide an axiomatic definition of these categories and a concrete representation of their objects as sets of solutions of algebraic systems of equations for many sorted infinitary algebraic theories. Concrete geometrical categories which are topological categories form a special class which is described axiomatically and concretely, and proved to be the basic concrete geometrical categories on which the others are build up.