Hyperfields are algebraic structures generalizing the concept of an algebraic field. In contrast to classical fields, summation in a hyperfield is multivalued, that is, the sum of two elements is not a single element, but a whole set of elements. Hyperfields find practical use in the theory of matroids and in tropical geometry, a variant of algebraic geometry. Matroid is an algebraic structure generalizing the concept of linear independence. There exist more types of matroids expanding the basic definition, e.g. oriented or valuated matroids. All of these definitions can be generalized to a single concept of an *F-matroid*, where F is a hyperfield. Tropical geometry is concerned with similar problems as algebraic geometry, only over the so-called *tropical semifield*. It finds many applications due to its combinatorial nature. Tropical geometry and algebraic geometry are closely tied by the so-called *Litvinov-Maslov dequantization* and hyperfields may be used to describe its generalized version.