

Abstract

In this work I introduce and study in details the concepts of *funcoids* which generalize proximity spaces and *reloids* which generalize uniform spaces, and generalizations thereof. The concept of funcoid is generalized concept of proximity, the concept of reloid is cleared from superfluous details (generalized) concept of uniformity. Also funcoids and reloids are generalizations of binary relations whose domains and ranges are filters (instead of sets).

Also funcoids and reloids can be considered as a generalization of (oriented) graphs, this provides us with a common generalization of calculus and discrete mathematics.

The concept of continuity is defined by an algebraic formula (instead of old messy epsilon-delta notation) for arbitrary morphisms (including funcoids and reloids) of a partially ordered category. In one formula continuity, proximity continuity, and uniform continuity are generalized.

Also I define connectedness for funcoids and reloids.

Then I consider generalizations of funcoids: pointfree funcoids and generalization of pointfree funcoids: multifuncoids. Also I define several kinds of products of funcoids and other morphisms.

Before going to topology, this book studies properties of co-brouwerian lattices and filters.

Keywords: algebraic general topology, quasi-uniform spaces, generalizations of proximity spaces, generalizations of nearness spaces, generalizations of uniform spaces

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