RESUMEN INGLES

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This doctoral thesis is devoted to investigate the problem of establishing connections between Domain Theory and the theory of fuzzy metric spaces, in the sense of Kramosil and Michalek, by means of the notion of a formal ball, and then constructing topological and computational models for (complete) fuzzy metric spaces.

The antecedents of this research are mainly the well-known articles of A. Edalat and R. Heckmann [*A computational model for metric spaces*, Theoretical Computer Science 193 (1998), 53-73], and R. Heckmann [*Approximation of metric spaces by partial metric spaces*, Applied Categorical Structures 7 (1999), 71-83], where the authors obtained nice and direct links between Domain Theory and the theory of metric spaces - two crucial tools in the study of denotational semantics - by using formal balls.

Since every metric induces a fuzzy metric (the so-called standard fuzzy metric), the problem of extending Edalat and Heckmann's works to the fuzzy framework arises in a natural way.

In our study we essentially propose two different approaches. For the first one, valid for those fuzzy metric spaces whose continuous t-norm is the minimum, we introduce a new notion of fuzzy metric completeness (the so-called standard completeness) that allows us to construct a (topological) model that includes the classical theory as a special case. The second one, valid for those fuzzy metric spaces whose continuous t-norm is greater or equal than the Lukasiewicz t-norm, allows us to construct, among other satisfactory results, a fuzzy quasi-metric on the continuous domain of formal balls whose restriction to the set of maximal elements is isometric to the given fuzzy metric. Thus we obtain a computational model for complete fuzzy metric spaces.

We also prove some new fixed point theorems in complete fuzzy metric spaces with versions to the intuitionistic case and the ordered case, respectively.

Finally, we discuss the problem of extending the obtained results to the asymmetric framework.