Publicacions més rellevants de la línia de recerca:

Lògiques No-clàssiques: Lògiques subestructurals, estructures algebraiques associades i complexitat

Referència: Bou, F., Esteva, F., Font, J.M., Gil, A.J., Godo. Ll., Torrens, A. and Verdú, V., Logics Preserving Degrees of Truth from Varieties of Residuated Lattices. *Journal of Logic and Computation* **19(6)**(2009), pp. 1031-1069.

Abstract: Let K be a variety of (commutative, integral) residuated lattices. The substructural logic usually associated with K is an algebraizable logic that has K as its equivalent algebraic semantics, and is a logic that preserves truth, i.e. 1 is the only truth value preserved by the inferences of the logic. In this article, we introduce another logic associated with K, namely the logic that preserves degrees of truth, in the sense that it preserves lower bounds of truth values in inferences. We study this second logic mainly from the point of view of abstract algebraic logic. We determine its algebraic models and we classify it in the Leibniz and the Frege hierarchies: we show that it is always fully selfextensional, that for most varieties K it is nonprotoalgebraic, and that it is algebraizable if and only K is a variety of generalized Heyting algebras, in which case it coincides with the logic that preserves truth. We also characterize the new logic in three ways: by a Hilbert style axiomatic system, by a Gentzen style sequent calculus and by a set of conditions on its closure operator. Concerning the relation between the two logics, we prove that the truthpreserving logic is the extension of the one that preserves degrees of truth with either the rule of Modus Ponens or the rule of Adjunction for the fusion connective.

Referència: Petr C., Francesc E., Joan G., Ll.,Franco M., Carles., Distinguished algebraic semantics for t-norm based fuzzy logics: Methods and algebraic equivalencies. *Annals of Pure and Applied Logic*, **160**(2009), pp. 53–81

Abstract: This paper is a contribution to Mathematical fuzzy logic, in particular to the algebraic study of t-norm based fuzzy logics. In the general framework of propositional core and δ-core fuzzy logics we consider three properties of completeness with respect to any semantics of linearly ordered algebras. Useful algebraic characterizations of these completeness properties are obtained and their relations are studied. Moreover, we concentrate on five kinds of distinguished semantics for these logics - namely the class of algebras defined over the real unit interval, the rational unit interval, the hyperreals (all ultrapowers of the real unit interval), the strict hyperreals (only ultrapowers giving a proper extension of the real unit interval) and finite chains, respectively -

and we survey the known completeness methods and results for prominent logics. We also obtain new interesting relations between the real, rational and (strict) hyperreal semantics, and good characterizations for the completeness with respect to the semantics of finite chains. Finally, all completeness properties and distinguished semantics are also considered for the first-order versions of the logics where a number of new results are proved.

Referència: Gispert, J. and Torrens, A., Boolean representation of bounded BCK-algebras. *Soft Computing*, **12** (2008), pp. 941–954.

Abstract: We define the Boolean center and the Boolean skeleton of a bounded BCK-algebra, and we use the Boolean skeleton to obtain a representation of bounded BCKalgebras, called (weak) Pierce bBCK-representation, as (weak) Boolean products of bounded BCK-algebras. We analyze the cases in which the stalks in these representations are directly indecomposable, finitely subdirectly irreducible or simple algebras. We give some examples of algebras and relative subvarieties of bounded BCK-algebras to illustrate the results.