



LOGIC AND COMPUTATION

## A New Characterisation of BFFs via Higher-Order Rewriting.

Deivid Vale

(Radboud University, Nijmegen, NL)

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15h - 16h

Math Department- Mini Auditorium

### Abstract.

The class of basic feasible functionals (BFF) is the analog of PF (polynomial time functions) for type-two functionals, that is, functionals that can take (first-order) functions as arguments. BFF can be defined by means of oracle Turing machines of time bounded by a second-order polynomial. On the other hand, higher-order term rewriting provides an elegant formalism for expressing higher-order computation. In this talk, address the problem of characterizing the class BFF by higher-order term rewriting. Various kinds of interpretations for first-order term rewriting have been introduced in the literature for proving termination and characterizing (first-order) complexity classes. In this recent work, we consider a notion of cost-size interpretations for higher-order term rewriting and see definitions as ways of computing functionals. We then discuss a novel characterization of BFFs by means of higher-order rewriting and the higher-order interpretation method. Finally, we will shed light on the soundness and completeness of such rewriting-based characterizations of higher-order complexity classes. This is a joint work with Patrick Baillot, Ugo Dal Lago, and Cynthia Kop.