

Department of Mathematics

Computational tools for Algebra

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(Researcher)

- Assistant Professor FCT;
- Member of Editorial Board of the Journal of Semigroup Theory and Applications;
- Pool referee for the European Science Foundation;
- Coordinator of the project B-8/09, of “Ações Integradas Luso-Britânicas”;
- International collaboration;
- Published several refereed articles in journals such as Journal of Symbolic Computation, Information and Computation and Theoretical Computer Science;
- Referee for several Journals;
- Member of the directive board of CAUL;
- Member of the Scientific Commission of Math & Application Master;
- PhD, Master’s & Scholarships jury;
- Organized and presented at Internat. Math Conferences.

Objectives

The main goal of the project is to develop software to deal with algebraic objects. We intend to develop packages for the computer algebra system *GAP* (Groups, Algorithms, Programming) and for the automated theorem prover *Prover9-Mace4*.

This software will allow researchers to easily identify algebras and therefore help them to obtain new results.

Methodology

We intend to develop a package that, for a given semigroup, will identify in the semigroup some of its ‘smaller pieces’, easier to understand. It is crucial to decompose the semigroup, but it is also important to identify the given semigroup as some well known semigroup theoretical construction of those ‘smaller pieces’.

With *Prover9* we will develop algorithms to better use the program in order to obtain, for example, minimal generating sets or shorter proofs. We expect to make possible the interaction of both programs.

Expected Results

The possibilities given by the software will give the research community in algebra, an opportunity to easily identify some of the objects they are dealing with. It is expected to submit a package through a refereeing process.

