

**ID: MSCA-2020-BBogaerts04**

**Title: Efficient algorithms for combinatorial search**

Research towards efficient algorithms for combinatorial search, in domains such as answer set programming, Boolean satisfiability, Quantified Boolean Formulas, Constraint Programming, Pseudo-Boolean solving and Mixed Integer Programming is greatly valued in my lab.

The research can involve efficient general purpose algorithms, pre-processing techniques (of particular interest here is symmetry detection and the combination with group algebra, as well as different methods for symmetry exploitation), in-processing techniques, and translations between formalisms.

Not just the satisfiability problem itself, but also related problems such as finding unsatisfiable subsets (that are optimal with respect to some criterion) are of interest.

Also of particular interest is research towards combining techniques from different fields and hybrid systems (e.g., lazy clause generation), as well as how to exploit high-level representations (such as minizinc models, first-order logic theories, and first-order answer set programs) and the benefits that can be obtained by starting from this representation rather than a lower-level (e.g. propositional) encoding.

**Supervisor:** [Bart.Bogaerts@vub.be](mailto:Bart.Bogaerts@vub.be)

**Research Group:** <https://ai.vub.ac.be/>

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