Universidade do Minho

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**PhD proposal**

# 1 Research centre

- Algoritmi research centre.
- NSOS (Nonlinear Systems Optimization and Statistics) research group.
- www.norg.uminho.pt/NSOS.

# 2 Supervisor

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# 3 Title

## MultiObjective Particle Swarm optimization

## 4 Keywords

Multiobjective optimization, software development, MATLAB.

## 5 Summary

The work consists in the development and implementation of an algorithm for multiobjective optimization that uses the particle swarm paradigm.

## 6 Description

Multiobjective optimization consists in the simultaneous minimization (or maximization) of a set of objective functions, which are often conflicting. Recent developments in the multiobjective derivative free optimization are available in the DMS software package (see www.mat.uc.pt/dms). These developments can be further extended to be included in a population based algorithm like particle swarm. The PSwarm (Pattern Search Particle Swarm - www.norg.uminho.pt/aivaz/pswarm) is a software package developed for uniobjective optimization and is a natural package to be extended for multiobjective optimization.

The work consists on the development of a population based algorithm for multiobjective optimization and its implementation in the PSwarm solver.

## 7 Scientific background

No prior knowledge on optimization or MATLAB is necessary.