# WORKING PAPER

# An Artificial Immune System based approach for solving the Nurse Re-rostering Problem

**Broos Maenhout**[*]

**Mario Vanhoucke**[†]

[*] Faculty of Economics and Business Administration, Ghent University, Gent, Belgium
broos.maenhout@ugent.be
[†] Faculty of Economics and Business Administration, Ghent University, Gent, Belgium
Operations & Technology Management Centre, Vlerick Leuven Gent Management School, Gent, Belgium
mario.vanhoucke@ugent.be

**Abstract**

Personnel resources are a variable and dynamic resource that introduce uncertainty in the operational processes. Constructed personnel rosters can be disrupted and render infeasible rosters. Feasibility has to be restored by adapting the original announced nurse rosters. In this paper, we investigate the potential of an artificial immune system to solve the nurse re-rostering problem, which entails a reactive approach to these schedule disruptions. In our computational results, we show that the proposed procedure performs consistently well under many different circumstances. We validate the performance of different problem-specific operators and compare the proposed procedure with the existing literature.