

# ABSTRACT

This dissertation presents an implementation of a parallel genetic algorithm using the coarse grained model, also known as the islands model, targeted to MPSoCs systems. MP-SoC systems are becoming more and more complex, due to the greater computational power demanded by applications, mainly those that deal with multimedia, Internet and wireless communications, which are executed within these systems. Some of these applications are starting to use genetic algorithms, that can benefit from the parallel processing offered by MPSoC. In the island model for parallel genetic algorithm, each processor is responsible for evolving the corresponding population independently from the others. Aiming at accelerating the evolutionary process, the migration operator is executed periodically in order to migrate the best individuals among islands. Different logic topologies, such as ring, neighborhood and broadcast, are analyzed during the migration step. Experimental results are generated for the optimization of three functions found in the literature.

**Keywords:** network-on-chip, parallel genetic algorithms, embedded systems.