**[Scheduling in autonomic distributed computer systems](https://www.ferit.unios.hr/dokumenti/projekti/MZOS-RH/Scheduling%20in%20autonomic%20distributed%20computer%20systems.docx)**  
Lead researcher: **prof.dr.sc. Goran Martinović**  
Duration: 01.03.2007. - 31.12.2013.

Resource management leading to autonomy is an important hypothesis for establishing a distributed computer system in demanding applications. That environment of dedicated and non-dedicated computers is extremely heterogeneous and time varying. Resource management corresponds to mapping which consists of matching jobs to computers and scheduling tasks on the matched computer. From the point of view of combinatorial optimization, both cases deal with scheduling. Heterogeneity and dynamics significantly increase scheduling complexity. On the other hand, environment heterogeneity prefers execution of tasks of various demands. In these circumstances achieving an autonomic distributed system requires careful environment description, timing order of mapping and special scheduling algorithms. With respect to the above hypotheses, the main goals of the project are to: - analyze a classical scheduling theory and adjust it to demands for autonomy of distributed systems, - establish prerequisites of successful scheduling, such as multilayered and multiparameter environment descriptions, taking into consideration its dynamics and representing it accurately enough, - establish mapping which comprises monitoring of environment, determination of machines candidates for mapping, matching and scheduling, - analyze the existing and offer our own scheduling procedures based on the expected execution time and load balancing, - develop an autonomy mechanism based on long-term and short-term performance prediction, - realize the above mentioned software solutions and test them in the testing and the real environment in accordance with project goals and application. Expected results i.e. methodology, analyses, algorithms and software solutions should enable effective and flexible resource management. It should be autonomic, i.e. renewable, extensible, and operating with increased reliability. Research results will be checked by complexity analysis and simulation upon completion of every individual phase of the project. After completing parts of the software solution, checking will be done on the testing and the real distributed environment in application. Pervasiveness and ubiquity of distributed computer systems, such as a computational grid, requires resource management which enables autonomy and flexibility to applications. Such distributed systems will be interesting both to research institutions and industry and economy.