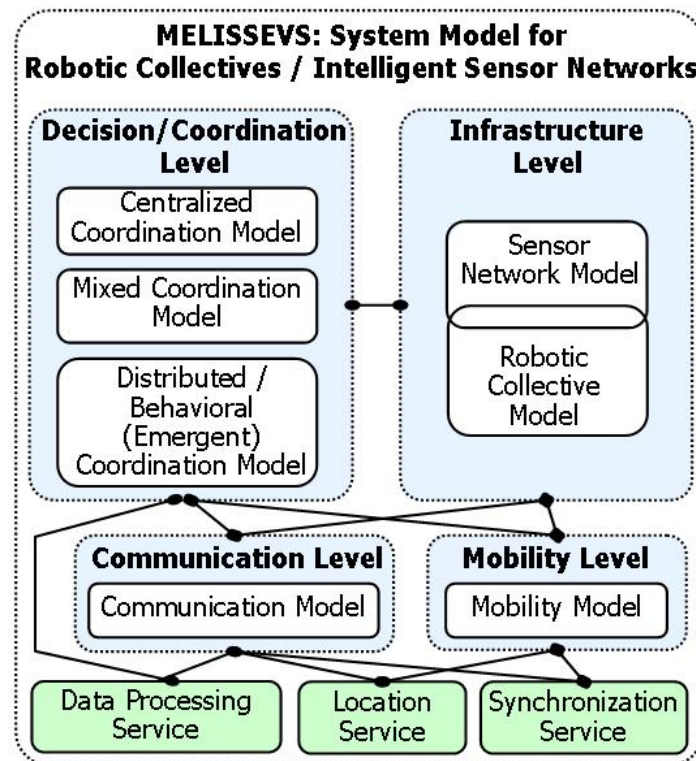# MELISSEVS
Model for Representation of Collaborative Robotic and Intelligent Sensor Systems in Environment Exploration and Supervision

Project Type	R&D Contract, National Research, Development and Innovation Plan II (PNCD II), "Ideas" Program, Exploratory Research Projects (PCE), MEdC-UEFISCSU, Ministerul Educatiei si Cercetarii, Bucuresti, Romania
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Project Goal

To conceive, develop and analyze an integrated model of representation of collaborative robotic and intelligent sensor systems, MELISSEVS, which is intended for the implementation of environment exploration-supervision applications which have a direct impact on the modern informational society, on the introduction of the latest technologies in industry and the everyday life and on protection of the environment.

Main Objectives

1 The study of the existing models for formalizing collaborative behavior patterns

2 The definition of a coherent set of models for formalizing collaborative / associative behavior patterns

3 The evaluation and testing of the defined models for collaborative / associative behavior patterns

4 The study and analysis of the communication, localization and synchronization solutions which exist in the field of sensor networks

5 The modeling of the infrastructure, of the offered services and of the interactions in intelligent sensor networks

6 The development of an efficient methodology for the coordination and distribution of tasks in collaborative systems

7 The integrated analysis and system-level evaluation of the set of models which were developed for the representation of the collective behavior patterns of associative robotic systems and intelligent sensor networks

8 The development of a set of websites which are intended for the presentation of the project and for the presentation of the application that have been developed with it

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Project Specifications

The *MELISSEVS* system (**M**odel for r**E**presentation of co**L**laborative robotic and **I**ntelligent **S**ensor **S**ystems in **E**n**V**ironment exploration and **S**upervision applications, read *Melisseus* – the god of bee swarms and melliferous process in the Greek mythology) is designed as an integrated model for describing collaborative robotic systems and intelligent sensors, for environment exploration-supervision applications, with direct impact on the modern informatics society and the introduction of new technologies in industry and domestic life, as well as for the environment protection.

The components of MELISSEVS (see figure on page 1) represent the main abstraction levels of collaborative robotic and sensors systems: infrastructure, communication, mobility, coordination and decisional levels, along with the main services offered by these systems: data processing service, localization and synchronization service.

The modeling of processes and interactions among the components of the MELISSEVS system, which are mostly probabilistic, will be based on stochastic formalisms (discrete time Markov chains - these models will describe the behavior of each submodule by estimating the probabilities of transition from one state to another in a precise time unit). The system model, with respect to decisional/coordination level, will be based on development and integration of the *eBML* (*Emergent Behavioral Modeling Language*) formal language recently designed by the team members.