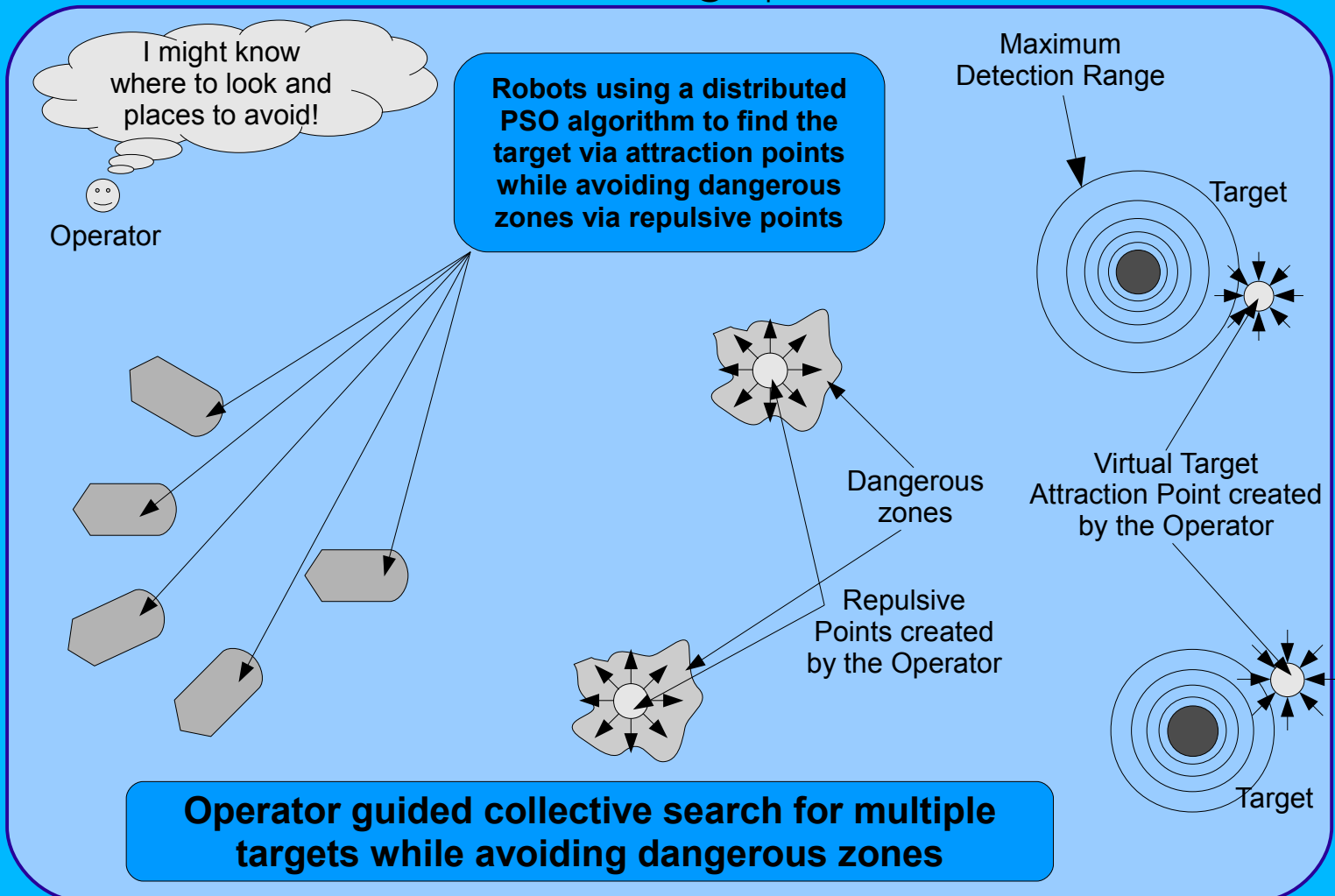


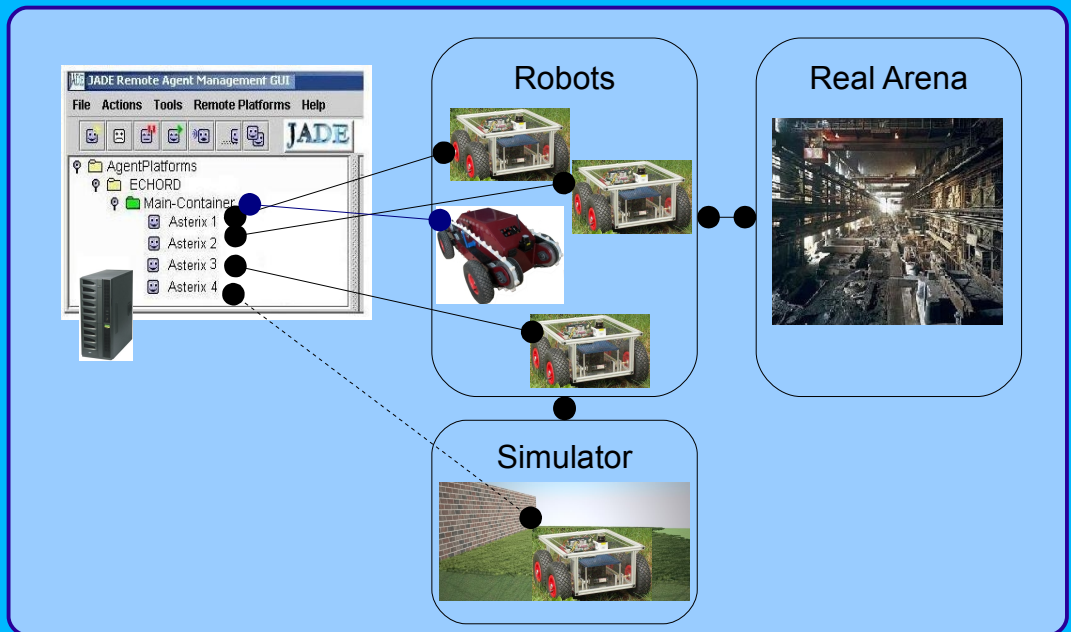
# Human - Swarm Interface Design and New Control Techniques for Swarms of Autonomous Mobile Robots

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The project's main objectives are as follows:

- The development of the distributed control system for the swarm using two innovations: a new swarm control method (Gravitational Points Method) and the power of membrane computing. They are used to enhance a PSO-inspired algorithm;
- The development of a high-level Swarm User Interface (SUI);
- Testing the system and the interface in a simulated environment and on a robotic swarm, in a real environment;
- Building a knowledge repository for the technology transfer between academic research and industrial companies;



- Two scenarios are proposed in order to test and prove the utility of such a system: intervention in case of an accident and hazardous materials transportation
- The original technique introduced for this project, Gravitational Points Method (GPM), may be promising because it can be used to define complex behaviours of the swarm systems, such as searching, carrying, cooperation (mutual help), self-organization etc. A very important property of this method is that it is simple in concept and implementation, but it can be used, together with PSO, to solve a wide range of problems.