

THE USE OF AGENTS IN MODELING HUMAN BEHAVIOR

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INTELLIGENT AGENTS

An intelligent agent can be perceived as a computational entity, for example, a robot or software program, that is able to perceive and autonomously act upon its environment.

As mentioned an agent exists and operates in some environment, which is both computational and physical and may or may not contain other agents.

In a single-agent system only one agent is used to solve problems.

Using only one agent may be suitable for some limited domains where there is no need for collaboration, however, such domains are rare in real life problems.

Usually entities interact and collaborate with each other in order to attain certain objectives. A single agent may not be capable enough or does not have the knowledge required to perform the task. Moreover, it may take too much time for a single agent to complete the assigned task. In such cases a multi-agent system is used.

BEHAVIOR MODELLING

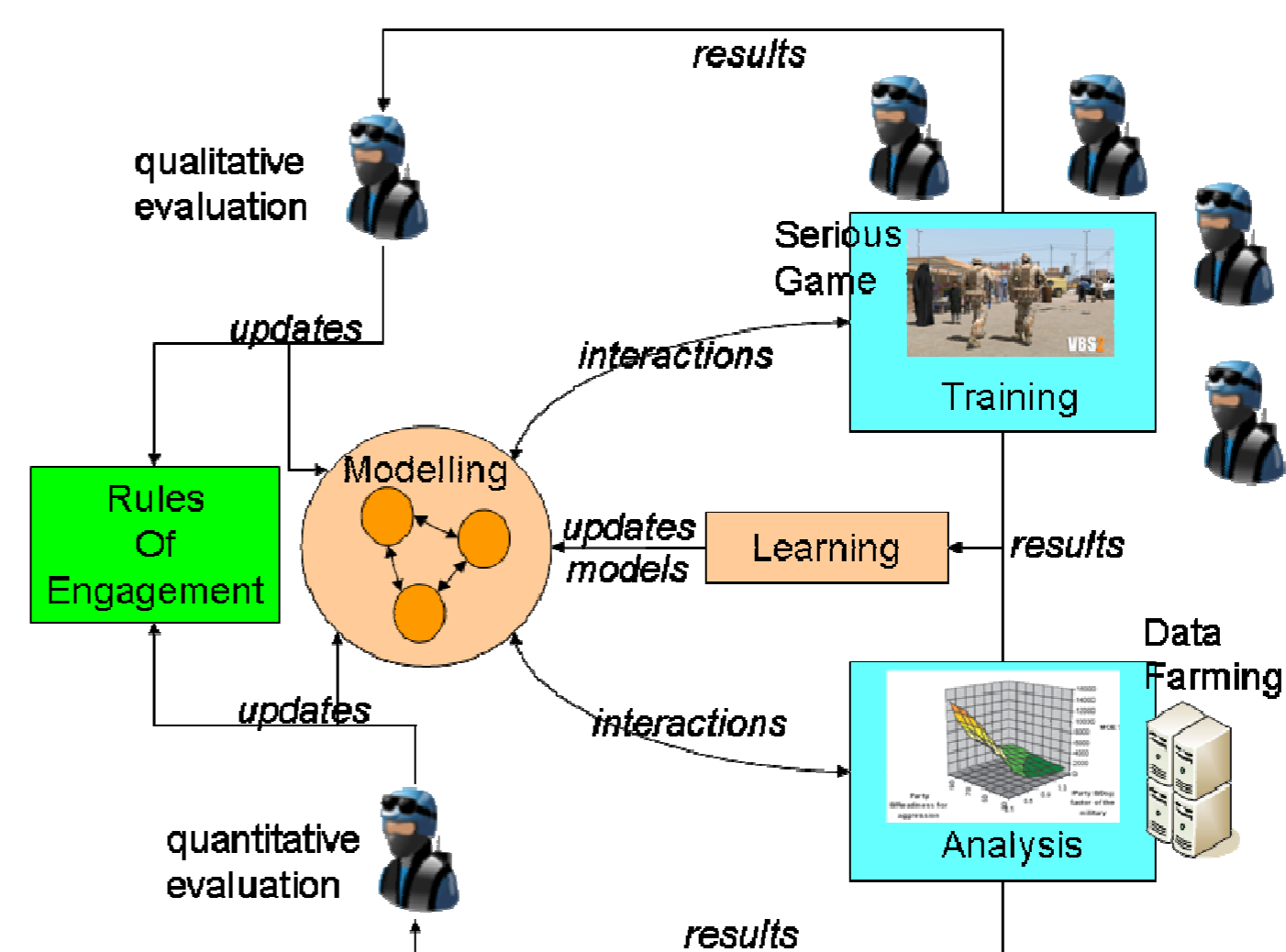
Learning about other agents in the environment is very helpful, this way we can make good guesses of their expected behavior and act accordingly (cooperate more effectively, for example). Imagine a computer program that would be able to model the preferences and habits of the user and would be able to adjust itself in order to facilitate

its use to the user. Computer guided characters (bots) in video games would pose a much greater challenge to a human player if they were able to learn from other players and imitate their behavior.

CROWDS

Crowd behavior modelling involves modelling the behavior of a large group of people, such as crowds in a range from civilian to hostile.

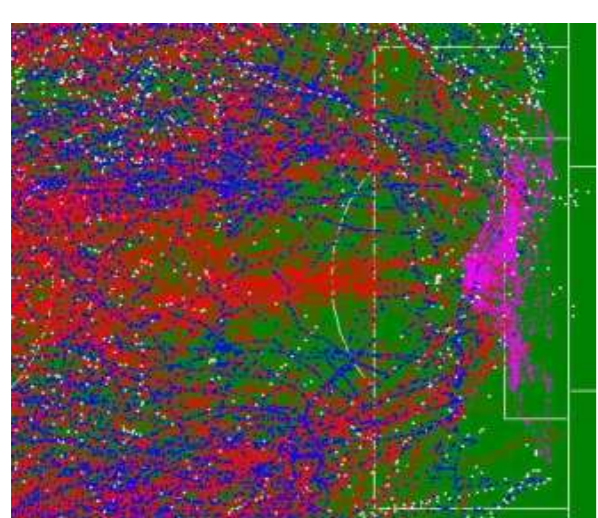
Behavior modelling would allow the development of highly realistic and reusable models of human behavior that can be used for various tasks (e.g. simulations, analysis, etc.)



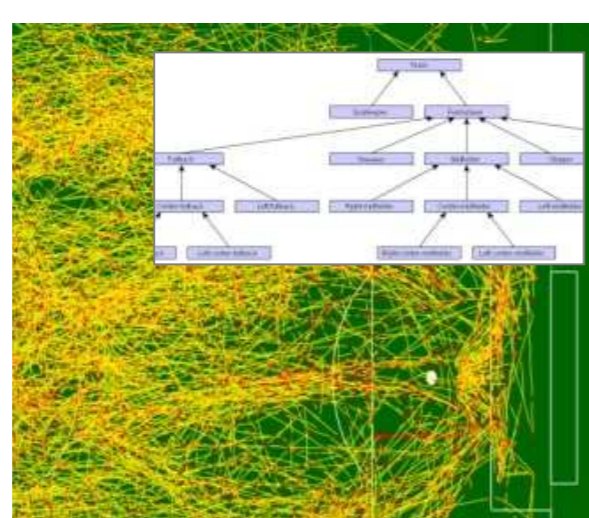
MULTI-AGENT STRATEGY DISCOVERING ALGORITHM

MASDA is able to discover common agent strategy by tracking low-level behavior of a group of agents and using only basic domain knowledge.

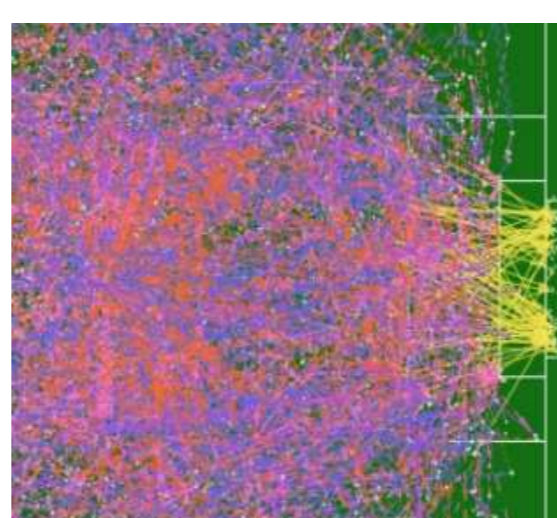
- Observe elementary actions
- Merge elementary actions into
- Find similar actions occurring repeatedly
- Extract strategy from repeated actions, describe with rules and present them in a graphical and symbolic way



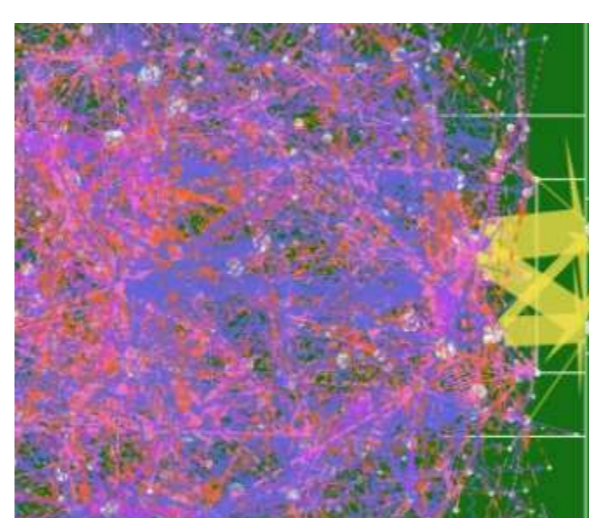
I.1



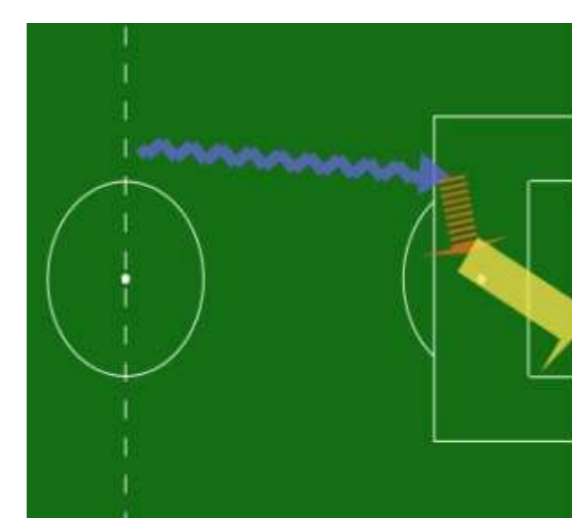
I.2, I.3



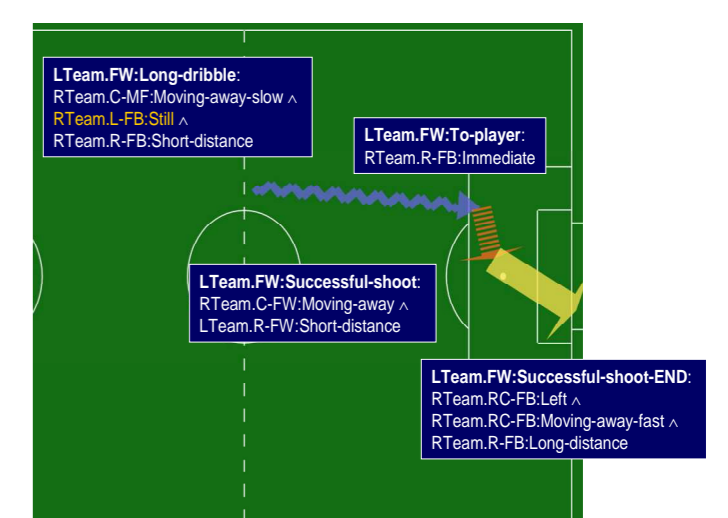
II.1



II.2



II.3



III.1, III.2, III.3

Numeric data (~3.000.000)	Symbolic data (~150.000)	Action graph (~6.500)	Abstract action graph (~1000)	Strategic action descriptions (~100)	Strategic concepts (~10)
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Increasing abstraction

