Cooperation of automata with real-time reactivity

Executive summary

A software solution allowing automata to adapt their behaviour to a dynamic changing context while coordinating their behaviour according to complex pre-established plans has been developed by a research group with wide experience in immersive virtual reality.

Background

Situated agents are automata that make real-time decisions based on goals and perceptions from their environment. They are typically used in videogames because they react fast and adapt to changing conditions.

However, their use in fields such as industrial robotics is fairly limited because the global outcome of their actions cannot be predicted beforehand.

Description

The invention processes an arbitrarily complex plan as a pre-established sequence of events and integrates it into a situated agent who uses real-time decision skills in a dynamic context. This gives the agents the skills to integrate the plan into their real-time decisions and to coordinate their actions in order to collaboratively achieve a pre-determined plan. This method takes into account the circumstances of the dynamic, changing environment.

For example, consider a car factory. Production lines typically have a rigid sequence of steps sequentially processed by different robots. Using our product, it becomes possible to build a car much more flexibly. Each agent may start building a different part, but it will adapt its behaviour to the needs of the other agents. The sequence of steps necessary to build a car is achieved in a distributed way.

This product can also be used to control cooperative interaction between humans and artificial agents. For example, in a first-person perspective war videogame, artificial agents can integrate a detailed feature film script (for example, Saving Private Ryan, or Apocalypse Now) that will be performed collaboratively. Thus, within the dynamics of the game the artificial agents will assume the different roles of the story. If the human participant assumes one of these roles, the other characters will integrate his actions within the unfolding story. He will also be able to introduce changes in the story, but only within the boundaries foreseen beforehand by the scriptwriter.

Advantages

- Automata show fast reactivity and adaptation combined with long-term predictable behaviour.
- A new way to achieve human-computer interaction for interactive storytelling

Current stage of development

The software solution is implemented and a proof of concept of its use for interactive stories in immersive virtual reality has been developed.

Goal

The group is looking for a license agreement, but other collaborations may be considered.

Patent

European Patent Application
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Reference

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