

GUI for Agent Based Modeling

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Abstract

We have developed SOARS VisualShell makes it possible to model an agent based simulation depending on a domain specific knowledge, without complex programming skill. On SOARS(Agent base simulation modeling language), SOARS VisualShell supports users to construct a model for complex interaction among agents inside virtual space. As a next step we extend SOARS and its VisualShell to construct a design for complex interaction among agents on the real world. In this paper, we discuss how to build a model of real world interaction among agents by SOARS VisualShell intuitively.

Keyword: Agent Based Modeling, SOARS, Real World Interaction

Big data analysis is becoming more important in IOT era, for experts in the field. It is also required to construct an agent based simulation model using the big data in each specific field. In addition we have to design a complex interaction on the real world depending on the simulation. However, it is heavy work for a domain expert to construct an agent based simulation model. In fact, many simulation models are built by using a programming language. It is difficult to construct a model for domain experts with no programming experience. To solve this problem, it is required to model without complex programming knowledge, just like using a CAD / CAM. For the purpose we introduce a concept of Modeling GUI(Model Driven User Interface).

As a Modeling GUI, there are several modeling tools. Matlab is a modeling language with modeling GUI to create a numerical model or a control model. Stella, is a simulation language with modeling GUI to create a system dynamics model. These modeling GUI require only control theory or mathematical knowledge about the system dynamics to create a model intuitively. As the same way we have developed a SOARS VisualShell for a domain expert to create an

agent-based modeling intuitively.

SOARS, as elements for model design, is composed of agent/spot as an object and a role as a method. The simulation process of SOARS is controlled by stage. SOARS VisualShell is a Modeling GUI to manipulate objects, methods and stages of SOARS visually and intuitively. SOARS VisualShell requires only the mouse operation as input / output equipment and the keyboard input only for the value input.

SOARS VisualShell is a Modeling GUI for an agent-based modeling, the code is published in open source, and it is still evolving. In addition, for the implementation of the function to utilize objects and agents in the real world for autonomous distributed control, we will develop SOARS as an agent based designing language where users can control process and operation in the real world, such as the operation of the actuator control and data collection from the sensors, intuitively.

References

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