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- interactive multimedia systems
- interactive simulations and games
- intelligent agents on the Internet
- intelligent tutoring systems
- microworlds
- virtual reality based learning systems

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The GET-BITS Model of Intelligent Tutoring Systems
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Ljubomir Jerinic
This article describes an object-oriented model of intelligent tutoring systems (ITS), called GETBITS. The article concentrates on class hierarchies and design of classes for knowledge representation in the GET-BITS model. Other models of intelligent tutoring systems used today, as well as the corresponding knowledge models, differ only to an extent. However, the design methodologies employed vary a lot and, sometimes, even remain blurred for the sake of the system functionality alone. Although using a shell or an authoring tool for developing intelligent tutoring systems brings more systematic design, it can also become a limiting factor if the shell/authoring tool doesn’t support a certain knowledge representation technique or design strategy that may be needed in a particular system. The GET-BITS model makes it possible to develop more flexible intelligent tutoring systems and the corresponding software development environments, significantly increasing their modularity and reusability. It is based on a number of design patterns and class libraries developed in order to support building of intelligent systems. Important parts of any ITS design process, like domain knowledge, pedagogical knowledge, student model, and explanation strategies, are all covered in the GET-BITS model. The advantages of the model are shown in the article by: (a) explicit discussion of several different aspects of the model, and (b) description of a GET-BITS-based intelligent tutoring system for teaching formal languages. The processes of computer-based tutoring and learning based on the GET-BITS model are much closer to human-based instruction. The model can be easily extended to cover the needs of specific tutoring systems. In addition, two extremely important issues are discussed from the GET-BITS perspective: the issue of ontologies in the area of intelligent tutoring systems, and the issue of software components in that area.
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The GET-BITS Model of Intelligent Tutoring Systems

The paper describes an object-oriented model of intelligent tutoring systems, called GET-BITS. The paper concentrates on class hierarchies and design of classes for knowledge representation in the GET-BITS model. Other models of intelligent tutoring systems used today, as well as the corresponding knowledge models, differ only to an extent. However, the design methodologies employed vary a lot, and sometimes even remain blurred for the sake of the system functionality alone. Although using a shell or an authoring tool for developing intelligent tutoring systems brings more systematic design, it can also become a limiting factor if the shell/authoring tool doesn't support a certain knowledge representation technique or design strategy that may be needed in a particular system. The GET-BITS model makes possible to develop more flexible intelligent tutoring systems and the corresponding software development environments, significantly increasing their modularity and reusability. It is based on a number of design patterns and class libraries developed in order to support building of intelligent systems. Important parts of any ITS design process, like domain knowledge, pedagogical knowledge, student model, and explanation strategies are all covered in the GET-BITS model. The advantages of the model are shown in the paper by an explicit discussion of...
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