Glossary

A

Access model: Model that specifies the different roles or stereotypes of a specific software system as well as the access capabilities for each kind of user.

Aesthetics: The study of the particular pleasures offered by communications media of all forms.

Agent's cognitive module: The bulk of the agent, according to the classical definition of agent as a continuous perception-cognition-action cycle. In this module, perceptions are analyzed and decisions about actions are made.

Agent's perceptual module: A solution to modeling the agent's perception by focusing on its perceptual sensors.

Agent-based architecture: A software architecture in which the basic building block is a software agent. In an agent-based architecture, each agent is capable of performing a certain set of tasks, and is capable of communicating with other agents to cooperate with them in the execution of those tasks.

Algebraic semiotics: The study of optimal representation via mappings of systems of signs, using methods from algebra and sociology.

Authoring tool: End users can use authoring tools to develop their own VE applications without having programming skills.

Avatar: Comes from Sanskrit and means reincarnation.

B

Believability: (As opposed to realism) Sensation felt by a human user of a virtual environment that catches his/her attention, not exactly because of its fancy graphics, but because of the richness of its avatars' behaviors.

Blackboard: A common data structure that will be used concurrently by several agents to build plans collaboratively. Each agent can observe the contents of the blackboard and decide proactively when it is appropriate to modify it.

Blend: A combination of two (or more) sign systems into a single sign system.

C

Clarity of perception: A measurement of the ability to distinguish what kind of object is being perceived by the agent.

Collaborative task planning: In an IVET, the students will be posed with problems consisting of determining how to reach a certain final state in the virtual environment from the current state. The system should also have the capability of building solution plans. A plan consists of a sequence of tasks that the students should perform in the VE. The construction of the plan will be performed collaboratively among different agents contributing with different types of knowledge.

Collaborative virtual environments (CVEs): Software programs that support users in managing communication across multiple media across the network. They are populated by objects and user representations, and provide a means of communicating, socializing, and exchanging ideas, as in real-life social systems.

Component: Component as a separated entity with a specific size. It is characterized by dependencies and the framework permits a dynamic loading of components. Components can be either large or small, but they have to be of a clear structure. A visible component has its geometry, a property, and finally it is characterized by a behavior.

Composed component: Components can be very simple, but they can also be composed of other simple components. They are often called composed components or compound components.

Conceptual model: Abstract representation of a system that describes its static components, relationships, and dynamics in terms of elements of the

universe of discourse instead of using technical terms and implementation units.

Content model: An abstract characterization of the perceptual content of interactive media.

Conventional groupware: A system that allows remotely located participants taking part in a collaborative activity (shared activity) to view the context and interact through it.

D

Data-sharing mechanism: The mechanism by which a particular virtual environment is shared between different processes implementation.

Deliberation: Conscious, attentive process that uses general purpose resources to focus and address the primary concerns and goals of the agent.

Design guidelines: Design guidelines provide a way of encapsulating a research's results and providing application designers with direct advice and design solutions.

Design methodology: The study of the method of design.

E

Environment model: The methods and structures by which the system allows description of collaborative virtual environments.

F

Framework: The structure of a typical client or platform in terms of the services it provides to the user.

G

Gem: Similar to existing gems collections (game programming gems, graphic gems), there exists the terminology MR gem. A gem represents an efficient solution (e.g., software code, library) to a specific MR problem.

H

Hypermedia: Associative structure of multimedia nodes that can be freely browsed.

Hypermedia design: Systematic process oriented towards producing usable and useful hypermedia systems.

I

Information rich virtual environments: Virtual environments augmented with abstract information such as text, numbers, and graphs.

Information visualization: The representation of information using graphical media; a special class of semiotic morphism.

In-slot: Each component is composed of in-slots, which can receive data from the previous component.

Intelligent tutoring system (ITS): A tutoring system intended to adapt the teaching and learning process to the needs of every individual student. To that aim, the system should have knowledge and competence in four distinct areas that give rise to the four classical components in the architecture of an ITS: expert module (knowledge about the subject matter); tutoring module (competence about teaching and learning); student module (knowledge about the student); and communication module (competence about communicating with the student).

Intelligent virtual agent (IVA): An autonomous embodied agent usually in a 3D interactive graphical environment or virtual environment (VE), which draws on artificial intelligence (AI) and artificial life (Alife) technology so as to interact/communicate intelligently with its environment and with human users/IVAs.

Intelligent virtual environment for training (IVET): Results from the combination of a virtual environment (a 3D graphical model) and an intelligent tutoring system (ITS). The goal of this kind of system is to train one or more students in the execution of a certain task. IVETs are able to supervise the actions of the students and provide tutoring feedback.

Interaction Analysis (IA): Has its roots in the social sciences, and perceives knowledge and action as fundamentally social in origin, organization, and use. It studies human activities, such as talk, non-verbal interaction, and the use of artifacts and technologies. It is primarily defined by its 'analytic foci' or ways into a videotape. Such foci include: structure of events; temporal

organization of activity; turn-taking; trouble and repair; and spatial organization of activity. Important to *Interaction Analysis* is the data analysis by a group of analysts.

Interaction machine: A model of computation that incorporates interaction with the environment in which the machine exists; inherently more powerful than Turing machines.

Internal-external interaction: Whether in a collaborative activity the users' interactions take place face-to-face in the real world, or via the computer using the tools the system provides. Face-to-face user interaction in the real world is referred to as being 'external' to the system. User interactions and communication via the tools that the system provides is referred to as 'internal' to the system (e.g., between virtual actors within the environment).

M

Magic interfaces: Interfaces that are not inspired by natural interaction and thus less intuitive but potentially more effective.

Mixed reality (MR): Involves the merging of real and virtual worlds somewhere along the reality-virtuality continuum, which connects completely real to completely virtual environments.

N

Network topology: The way in which a set of clients are networked together. Typically this is client-server (everyone connects to a central server forming a "star") or peer-to-peer (everyone connects to everyone).

O

Out-slot: Each component is composed of out-slots, which can send data to another component.

P

Path planning: For many tasks to be carried out in a virtual environment, it is necessary to navigate along the space avoiding collisions with objects and possibly minimizing distance. A path planning agent will calculate the best trajectory for each displacement that an avatar must do in the VE, from geometrical information related to the VE.

Pedagogical agent: A software agent that is in charge of the supervision of the learning process in an IVET. Pedagogical agents can be embodied and inhabit the virtual environment together with the students, or they can be just a piece of software that interacts with the student via voice, text, or a graphical user interface.

Presentation design: Design of the appearance and organization of the user interface.

Process model: Both an ordering of the activities that comprise a design method and a characterization of the linkages between them.

R

Reaction: Automated, pre-attentive process triggered by the agent in response to any change in the environment state or in the agent internal state.

S

Scalability: The ability of a collaborative virtual environment system to support large numbers of users and large virtual environments.

Scene graph: Provides a high level of abstraction in computer graphics and stores the whole scene in the form of a graph of connected objects (often called nodes).

Semiotic morphism: A representation of meaning and/or functionality, given as a mapping from one sign system to another.

Semiotics: The study of signs and systems of signs.

Semiotics: The study of the way humans find meaning in the world around them.

Single display groupware: A system that allows the participants taking part in a collaborative activity (shared activity) to view the context of interaction through a single, shared display.

Space-based relationship: Relation among two or more information items which establishes the position in a 2D or 3D space of an item, taking into account the position of another item.

T

Time-based relationship: Relation among two or more information items which establishes when an information item starts, ends, or how long it takes, taking into account when another item starts, ends, or how long it takes.

V

Virtual actors: Graphical forms that represent the collaborative virtual environments' inhabitants. They provide an appropriate body image to the users who participate in the collaborative activity to represent them to others, as well as to themselves.

Virtual environment (VE): A computer-synthesized, three-dimensional environment in which a plurality of human participants, appropriately interfaced, may engage and manipulate simulated physical elements in the environment, and in some forms may engage and interact with representations of other humans—past, present, or fictional—or with invented creatures.

Virtual environment modeling: Specification of a VE using concepts and relationships of a conceptual model.

Virtual reality melting pot: A theory that many related technologies are melding together through mutual advances in hardware, software, theories, and methodology into a larger technology for manipulating human senses in virtual, augmented, and real spaces.

Virtual world: The class of media experiences that provide a sense of immersion and closure.

Virtuality: A sense of being engaged with non-physically present entities through material mediation in the immediate real world.