

## A Story-Telling Intelligent Agent Based on Minsky's "Society of Mind"

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### Abstract

This paper describes a story-telling agent which is itself a multi-agent system composed of a blackboard structure and a number of smaller agents which both cooperate and compete against each other to present information according to each one's point of view. The agent architecture is based on a cognitive model, Minsky's Society of Mind. The story-telling agent is an example application of this architecture.

### Introduction

Artificial Intelligence has been traditionally concerned with making computers behave intelligently, but Fischer (Fischer 1995) has suggested using AI techniques to enable computers to augment human intelligence rather than mimic it. Our goal in doing research in intelligent agent architecture and design is to reach intelligence augmentation through agents rather than having truly intelligent agents.

The Society of Mind (SOM) model (Minsky 1986) describes the mind or agent as a "society" of tiny, mindless units also called "agents," organized in groups called "agencies." Agencies communicate by evoking and detecting configurations of agents called "partial mental states." The SOM model includes a number of coordination mechanisms related to the activation and recognition of partial mental states. These mechanisms include k-lines, recognizers, pronomes, frames, and paranomes.

### A Story-Telling Agent

The agencies of the SOM model are translated into agents of a Distributed Artificial Intelligence system, and both partial mental states and coordination mechanisms correspond to objects in a blackboard structure. Partial mental states comprise data structures operated upon by the agents and the coordination mechanisms themselves. The blackboard is divided into six horizontal sections which contain application-specific data structures, recognizers, k-lines, pronomes, frames, and paranomes. Every object in the blackboard has a state, except the recognizers; changing the

state of an object may cause other objects' states to change. This is done by one or more threads associated with the blackboard.

In the story-telling agent, application-specific data correspond to descriptions and pictures of scenes, characters, places, etc. and a set of keywords to be presented as "links" to the user. K-lines connect related data items; for instance, the items describing a character. Information structure is represented by "narrative" frames, which represent the sequential structure of the story; place frames, which represent physical and/or geographical structure; and character frames, which represent relationships between characters. Recognizers put objects into an "active" state according to other objects' states thus forming "reminding loops" (Minsky 1986).

The story-telling agent initially puts some "default" data items in a "hyperactive" state and shows them to the user. Recognizers react by putting some keywords in an "active" state. Each internal agent "wants" to present information according to a "personal view:" a "narrative" agent prefers to present scenes sequentially, a "character" agent prefers to talk about characters, and so on. Thus each one presents some of the keywords to the user. Choosing a keyword "hyperactivates" it and causes the recognizers to "hyperactivate" new data items, which are then presented to the user. Keywords resemble hypertext links; however, they are "softer" links, emerging from the action of recognizers which bring new data into the "focus of attention" of the agents in the blackboard.

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### References

- Fischer, G. 1995. Rethinking and reinventing artificial intelligence from the perspective of human-centered computational artifacts. In *Lecture Notes in Artificial Intelligence*, volume 991, 1-11. Springer.
- Minsky, M. 1986. *The Society of Mind*. Simon & Schuster.