Interfacing ACT-R to External Simulations Using Segman

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We have been using Segman (Shah, Rajyaguru, St. Amant, & Ritter, 2003; St. Amant, 2000; St. Amant & Riedl, 2001) to connect ACT-R models to off-the-shelf interactive, sometimes dynamic applications.

This approach replaces the Cognitive Model Interface Management Approach (Ritter, Baxter, Jones, & Young, 2000). Previously, the interface toolkit (User interface management system) was extended to support cognitive models so that they could see the objects in the interface and pass back actions. Segman removes the need to create this extension. It parses the bitmap and then either directly passes the objects to the model, or filters them through ACT-R/PM. This is shown in Figure 1. Previously, where the User Interface Management System was extended to support the model's interaction with the user interface, Segman now fills that gap, allowing the model to be more distinct from the interface, and removing the need to create a CMIMS..

This approach augments ACT-R/PM by providing a different way to provide models access to the contents of an interface. While it is particularly useful where the source code is not available or the interface is complex, we have tended to use it primarily for simple systems so far to illustrate this approach.
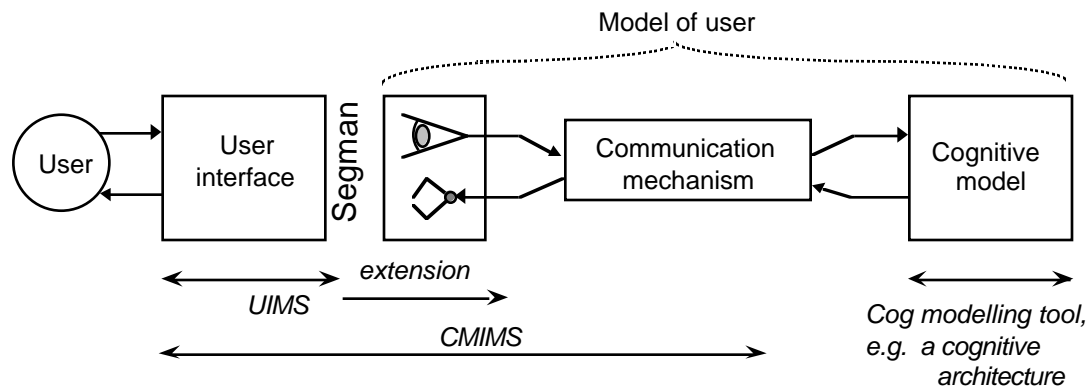

Figure 1. Cognitive Model Interface Management System with Segman.

Example systems that have used this approach are shown in chronological order in Figure 2. Current work includes interfacing Segman to Soar, providing an interface to Segman, and using it to see human-robot interfaces. The last task will again force new visual capabilities into Segman.

Further information is available on the web at www.csc.ncsu.edu/faculty/stamant/segman-introduction.html, acs.ist.psu.edu/papers, and acs.ist.psu.edu/papers/freed03.
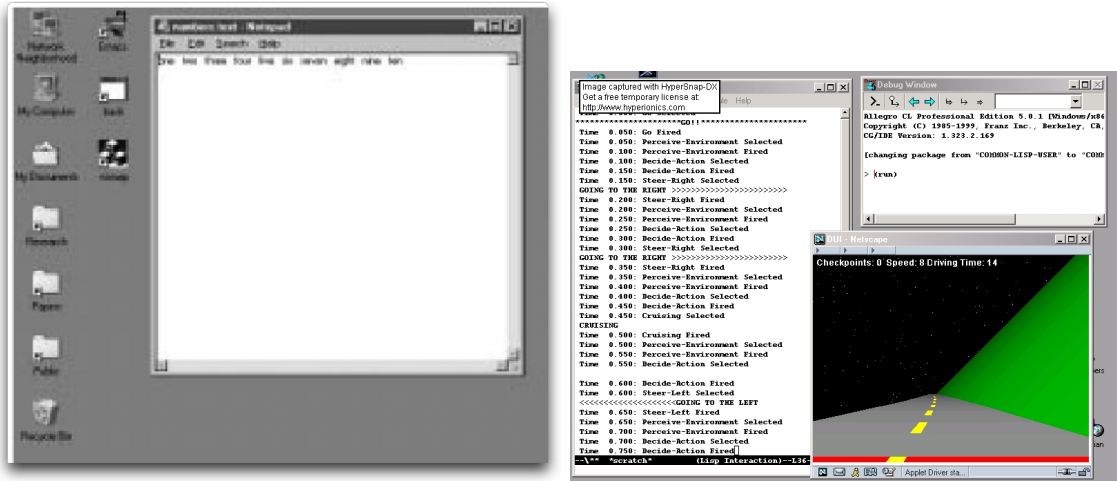
Figure 2a. Notepad under Windows (St. Amant & Riedl, 2001) and a simple JAVA driving game (Van Rooy, Ritter, & St. Amant, under revision).
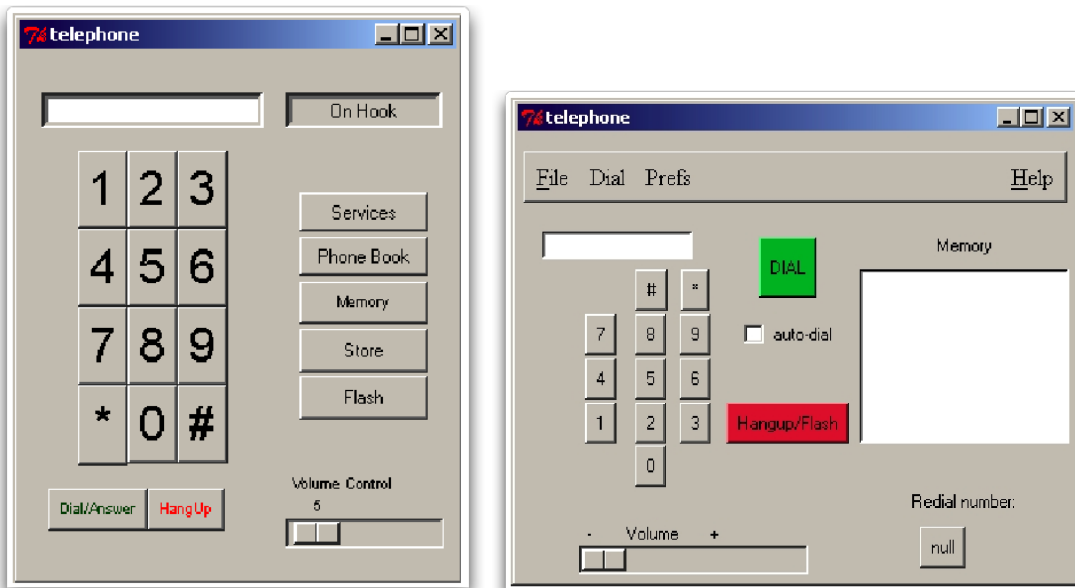

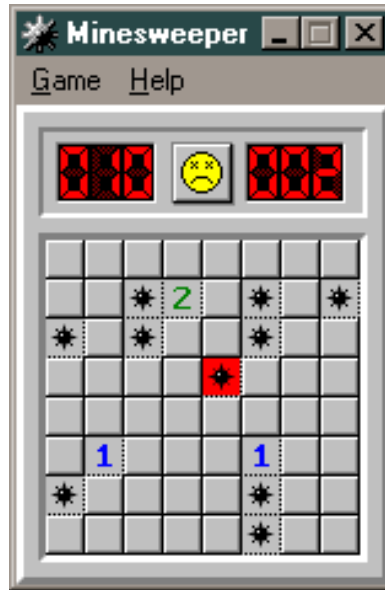Figure 2b. 10 Tcl/Tk Telephones (Freed, 2003), numbers 1 and 4.

Figure 2c. Minesweeper (2003).

Acknowledgments

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