Report for Brahms Project.

House Security System

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Our goal with this project is to create a simulation that will allow a security company to determine whether a sensor setup is good or not. The house security system may be activated or deactivated by entering the keypad's pin correctly. When the security system is activated a composite workframe is launched to listen for events caused by the sensors.

Before the security system can detect break-ins by Thief agents in an arbitrary house, it must be activated by its house-user. This is done through a keypad located within the House, and with a given pin it will be activated.

In order for a user to activate the House Security System, he/she must first move to the house where they want to activate it. After that the user initializes the keypad, which shortly after starting asks for the pin number to verify him. The user then enters the pin number on the Keypad, and it is verified. If the pin is not correct the user is prompted to enter the pin again, and then his work frames for remembering the pin and communicating it for the keypad are attempted again. Only three attempts may be made by the user, and on the third attempt, the user will no longer be prompted for a pin. (See Figure 1)

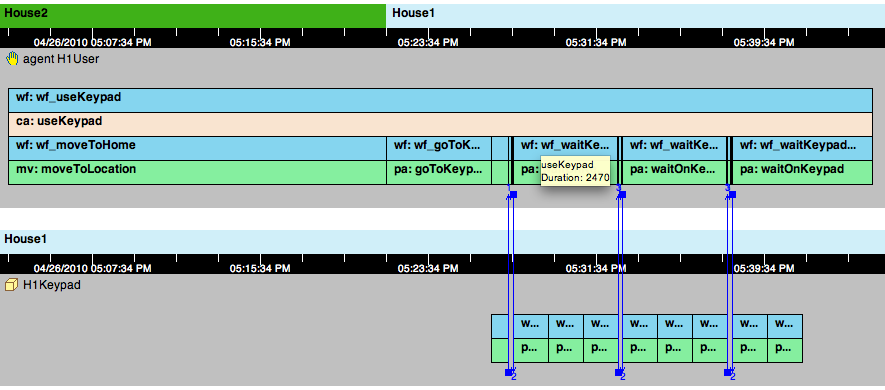


Figure 1.

If the user enters the correct pin then the user agent won’t be prompted by the keypad again, and it will be done using the keypad. The keypad then forwards the activation command to the Security System agent, by changing a fact in the world. The Security System detects this fact and switches to activated mode. (See Figure 2)

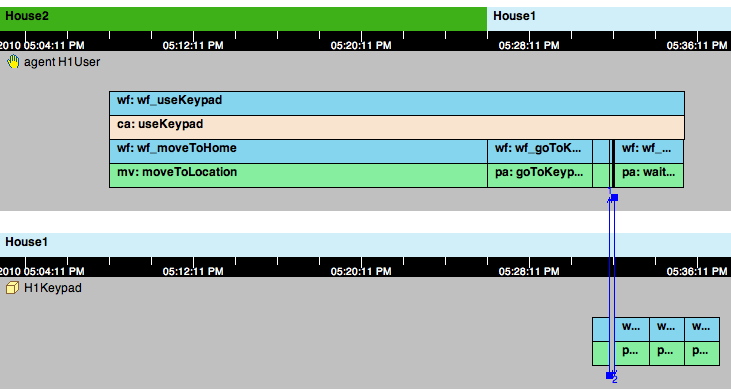
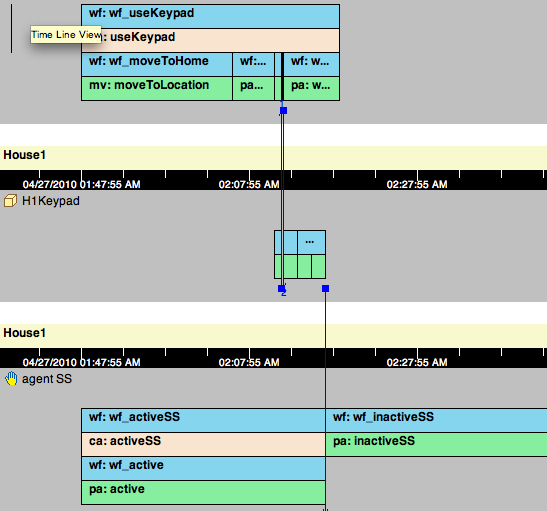
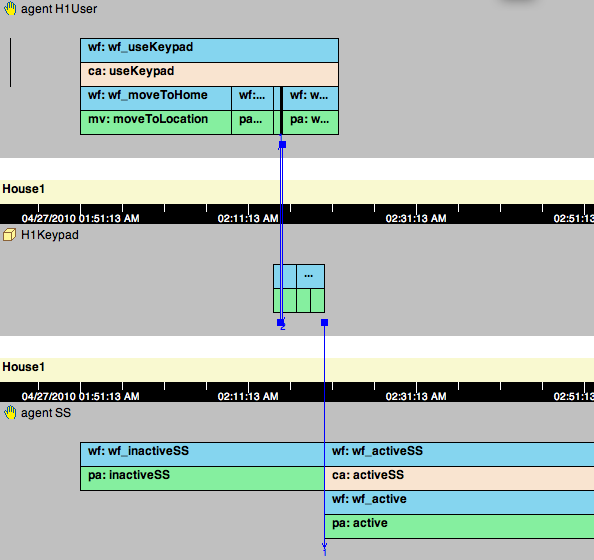


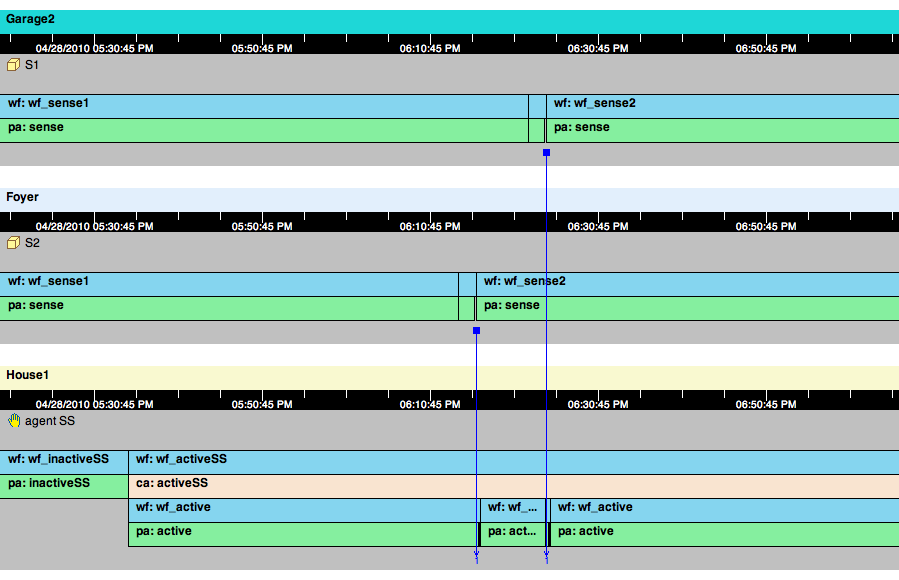
Figure 2

We chose to use a composite activity for activating the system, as there are certain activities that have as a precondition that the system is active. In that sense we evade checking for this in every workframe. The following illustrations Figure 3 and Figure 4 show how to activate and deactivate the system using the Keypad. The activation is actually toggled so that if the user keys in the code when the system is inactive, he will activate it. If he enters the code when it is active, he will deactivate it.





When a sensor detects a thief it communicates with the House security system agent (SS). These events are handled by a detectable within the House Security agent who handles the sensor alarms. The house security system then calls the other goes off detecting the thief it communicates to the active security system and triggers a procedure for handling the burglary.



The thief first determines an arbitrary order on how to visit the rooms. We determine this arbitrary order by concluding a first location with 100 percent certainty and then overwrite this conclusion with probabilities of 50 percent. The thief keeps track of the rooms he has visited before, so he will not visit a room more than once. He will also learn from his detections of the security response teams, which rooms have sensors on them. The thief does this by detecting the response team and leaving before being caught.

