A Chronobot for Time and Knowledge Exchange in E-Learning

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ABSTRACT

The chronobot is a device for time and knowledge exchange. The concept of the chronobot first appeared in a science fiction short story, “Nocturne,” written by the author some 20 years ago [2]. Recently, the Industry Technology Research Institute (ITRI) and Institute for Information Industry (III), two leading research institutes in Taiwan, invited the author to lead a pioneering project to put the ideas into practice to build a realistic device. The chronobot thus was conceived. The chronobot allows a group of people to exchange time and knowledge. This paper describes the basic concept of the chronobot, its mechanism for time/knowledge exchange, and its application to e-learning. Research issues are also discussed.

Keywords: just-in-time e-learning; knowledge exchange; negotiation protocol; quality of bid; time exchange; time schedule; virtual classroom

INTRODUCTION

The chronobot is a device for storing and borrowing time. Using the chronobot, one can borrow time from someone and return time to the same person or someone else. It is a convenient device for managing time.

The underlying premise of the chronobot is that there is a way to exchange time and knowledge. For example, one spends time to acquire knowledge and later uses this knowledge to save time. A group of people also can find some means to exchange time and knowledge. Thus, the chronobot is a device to facilitate the exchange and management of time and knowledge.

A natural application domain for the chronobot is e-learning, although we can think of many other interesting application domains for the chronobot. Indeed, whenever we need to exchange time and knowledge, we can make good use of the chronobot.

APPLICATION SCENARIOS

In this section, we describe two examples of the chronobot for e-learning applications.

John is a teenager. His parents recently bought him a chronobot. When John wakes up in the morning, he has breakfast and then takes the bus to the school. On
the bus, John has some free time. So, his chronobot says to John, “You know you have to write a big report on the eating habits of dinosaurs. Why don’t you spend some time now to collect some information? There is a rock concert at Point Park tonight. If you get the report done early, maybe your mom will let you go to the rock concert!” (Figure 1a).

John is excited about the rock concert and really wants to go, so he follows the chronobot’s advice and puts in some effort to collect and organize information. After the second class period, John again has some free time. Again, following the chronobot’s advice, John puts in some time to get more pieces of information and label them according to the chronobot’s suggestions (Figure 1b).

But John’s efforts later pay off. After John finishes school, he turns to the chronobot, who, to his delight, already has fused the knowledge together to form a rough draft of the report. John only has to do some editing, and in less than 20 minutes, the report is completed! But some critical facts need to be checked by John’s teacher. So, John goes to chronobot’s virtual classroom to interact with his teacher, Ms. Newman (Figure 1c).

In less than 10 minutes, John gets all the answers from Ms. Newman. It is only 6:30 P.M., and John proudly shows the finished report to his mother, who approves John’s request for an outing (Figure 1d). So, John happily goes to the rock concert with his buddies. If John did not have the chronobot, he would be stuck with the report-writing task the entire evening and miss the rock concert.

The example in Figure 1d pretty much explains the usefulness of the chronobot. As another example, for a professional media artist George, the chronobot serves the same function of timely knowledge gathering. But it can be even more useful,
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