A Design of an Intelligent Learning Agent using Learner's environment Information

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Abstract. The intelligent learning agents developed so far mostly provided learning contents to learners by analyzing environment information along with learners' basic information. Thus, if learning contents are recommended by considering only basic and partial information of learners, many times they do not accord with learners' demand, so it could be a factor that decrease learners' desire for studying and inhibit inducing motivation for studying. Therefore, this study provides an intelligent learning agent that automatically recommends studying contents that learners want in their real life by considering learners' environment information.

Keywords: Mobile, Situated Learning Theory, Context-aware, Augmented Reality.

1   Introduction

Smartphones and tablet PC are changing people's life pattern as they become popular due to rapid development of information and communication technology. Just as much IT devices have very close relationship with our lives. The new technology that could be only seen in movies can now be used easily by anyone even in education, so changes are occurring in learning by using mobile devices.

Although the learning by using mobile device could provide an environment where knowledge is transferred real-time through wireless internet, for learners to learn appropriate for their situation, they need to directly download appropriate learning contents from web servers.

However, the intelligent learning agents developed so far mostly provided learning contents to learners by analyzing environment information along with learners' basic information. Thus, if learning contents are recommended by considering only basic and partial information of learners, many times they do not accord with learners' demand, so it could be a factor that decrease learners' desire for studying and inhibit inducing motivation for studying. Therefore, this study provides an intelligent learning agent that automatically recommends studying contents that learners want in their real life by considering learners' environment information.

2   Related studies

Situated learning in mobile environment could be said as one of the new learning methods that are receiving the most attention nowadays. As mobile technology brought innovative changes in social and cultural fields just like when internet was first introduced in education field, the studies for using mobile technology in situated learning are going on actively.

Recently, the study on the supportive system that enables learning in the actual site, outside classrooms, by using mobile device is going on actively [1-5]. When several study cases related to it are examined, there are mobile learning contents design that supports situated learning by using cell phone device with wireless internet[6], study that realized learning contents in mobile device in a isolated form, and mobile learning system that can be used after downloading necessary contents to PDA from web server [7].

Intelligent agent is a system that attempts to achieve purpose autonomously to some degree in complex environment that changes, and it has been studied in artificial intelligent field under names as autonomous agent, software agent, and interface agent.

Intelligent agent that performs information search introduced machine learning to understand user intention more accurately, it automatically searched the expert of problems that users intended to solve by using collaborative filtering [8], and it suggested the agent that searches customized information by analyzing users' search tendency with genetic algorithm[9]. Horvitz et al. applied interactive agent, which deduces user intention through natural language by using Bayesian Network and provides relevant information, to MS-Office [10], and they modeled expert knowledge with neural network in information customization system based on multiple agents [11].

Therefore, this study develops intelligent learning agent based on Bayesian Network, which is collaborative filtering method based on model, so that it would be appropriate for mobile environment that requires real-time data handling.

3   The Proposed System

Context awareness module combines learners' location information by using GPS signal and learning ability information and provides learning contents appropriate to learners' current situation.

Learning recommendation module is the core of the proposed system, and it intelligently recommends learning contents provided to learners based on the result of learning time now available module and log information collection module.

Therefore, this study intelligently recommends the learning contents provided to learners by considering the results of the context awareness module, learning time now available module, and learning awareness logging information module.
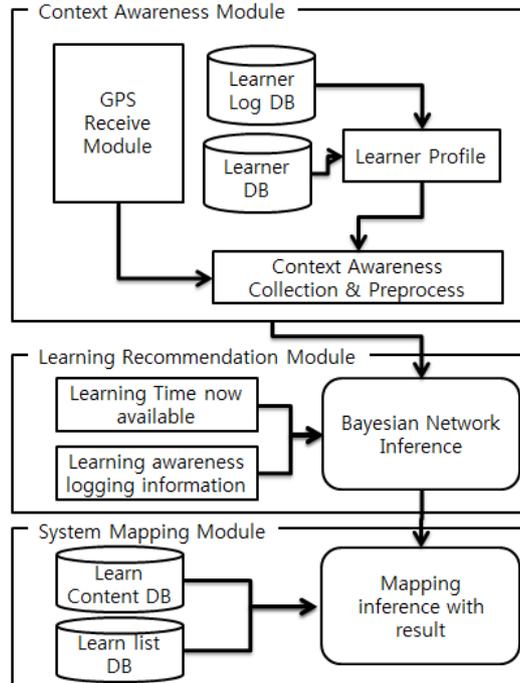
Fig. 1. The Proposed System

4 Implementation of the system

The environment for developing mobile learning support system is like Table 1. Since this study develops each module by using Visual C++, it leads the design with an object-oriented model, which can confirm all the defined process and express the system's characteristics well, as its basic.

Mobile learning support system materialized in this way was evaluated with the experiment group of twenty learners who gathered for learning according to the learners' situation information. And it confirmed whether the learning contents, which were automatically recommended to the learners when they had available time for learning, were fit.

5 Conclusion

This study suggests a filtering method for recommendation service system that considered learner's situation. For this, it recommends the contents that learners

should ultimately learn by using the goodness of fit of learners' learning contents, available time for learning, and learning awareness logging information.

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