ON DEMAND STATISTICS COURSES USING NEW TECHNOLOGIES IN JAPAN

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Recently most Japanese universities have been interested in new media education systems via the Internet. We are the key committee members of the Cyber Campus Consortium (CCC) for Statistics, which is one of consortiums of Japan Universities Association for Computer Education (JUSE), a non-profit organization under the auspices of Japanese Ministry of Education. The main purpose of the consortium is mutual cooperation between universities, which achieves the educational environment that could not be obtained by one university on the network through the portal site of JUSE. In this paper we introduce on demand statistics courses and multimedia teaching materials developed for this CCC project with international cooperation.

INTRODUCTION

The establishment of computer networks has brought about an age of substantial information disclosure, in which various branches of knowledge and types of technologies that read and utilize statistical data are becoming increasingly important. In university education, regardless of the field — natural sciences or social sciences — the knowledge of statistics is essential in conducting experimental studies. For this reason, various faculties and departments in many universities have adopted basic courses related to statistics.

In basic statistics education, where it is expected that positive analyses will be conducted, a practical type of education in which each student will be capable of using quantitative analytical skills is being increasingly regarded as highly desirable. A survey was conducted by Takeda (1995) and Senuma (2004) to determine what students were expected to study through mathematical studies at universities; this survey was conducted on all the companies listed in the Tokyo Stock Exchange. The results revealed that statistical education, which enables students to use data substantially, is regarded as highly desirable.

On the other hand, numerous statistics teachers in arts departments are of the opinion that students, in general, are hesitant to study the type of statistics that emphasizes mathematical aspects. Course materials utilizing the Internet and other multimedia resources have recently been developed and put to practical use in university education. Multimedia materials emphasize audio and visual components that can be interactively operated and verified. It is hoped that the use of multimedia will positively affect university education; however, no concrete lecture form that will create that positive effect has been standardized in the field of statistics. One of the possible reasons for this failure is that most of the syllabuses that are publicly available are developed in text form and are not based on Internet awareness or the course materials being converted into multimedia formats.

For the above reasons, we formed the “statistics” group from the social science-related fields within the Cyber Campus Consortium (CCC), which was developed at the Japan Universities Association for Computer Education. Further, we constructed a next-generation computerized syllabus system in order to initiate the establishment and use of databases for common development and so that multimedia course materials can be used in a concrete form for the purpose of standardizing the methodology of effective statistics education utilizing IT at universities. This paper provides the overview of our project.

DATABASE OF COMPUTERIZED COURSE MATERIALS

The database being created by the CCC Statistics Group currently includes concrete features such as lecture slides (in *PowerPoint* and html), documents explaining lecture contents (in *Word* and pdf), data for exercises (in *Excel*, *SAS*, *SPSS*, *STATISTICA*), analytical practice sheets and macros (in *Excel* and *SPSS*), statistical simulation graphs (with JAVA and Flash), cases of statistical analyses actually applied in society (in pdf), animation (with Flash), etc. All

these can be viewed and downloaded, based on the content category, type, author, and lecture purpose, from the CCC Statistics website (Figure 1). Figure 2 is an example of the animation material available in this database.

Figure 1: A Page of CCC Statistics website

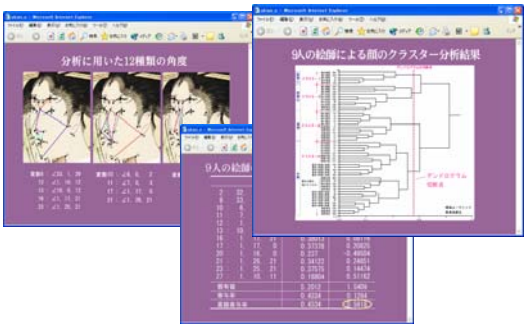

Figure 2: Screenshots Of An Animation

Figure 3: Electronic Book (Content page)

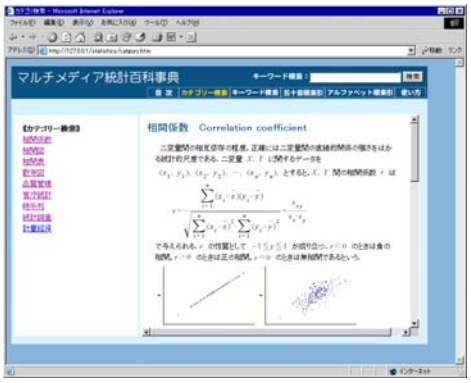

Figure 4: Multimedia Encyclopedia

In addition to the course materials database, other resources that will be made available are the electronic viewing system developed by the group members for statistics-related books that have been copyrighted for that purpose (Figure 3), the multimedia statistics encyclopedia developed with aid from the National Institute of Multimedia Education (Figure 4), and the descriptive statistics data analysis learning software system.

DATABASE OF COMPUTERIZED COURSE MATERIALS

A number of universities are currently making their lecture syllabuses publicly available and are constructing syllabus databases; however, most of these universities have directly converted the lecture summaries into text and do not really supply the actual examples of multimedia course materials being applied, thereby revealing their limitations as a reference system for course constructions utilizing IT.

The CCC Statistics Group has further developed the traditional electronic syllabuses that only displayed the lecture summaries, and the group has constructed a next-generation electronic syllabus system in a format that utilizes multimedia contents, such as text information to start with, and then images, movies, audio, JAVA applets, etc.

By using Web technology, the system proposed by our project facilitates the creation of lecture courses that have an electronically layered structure. More concretely, this system enables easier and more appropriate document coordination by collaterally adding multimedia objects to the text-based layered contents. Figure 5 right is a screenshot of the interface through which the electronic syllabus, including multimedia contents, can be viewed by students and others. Figure 5 left is a screenshot of an editing page meant only for texts created by teaching staff in order to display the image represented in Figure 5 right.

Figure 5: Image of Syllabus for Student and Syllabus Editing for Teaching Staff on the Interface

The lecture scenario, which was once understood as tacit knowledge shared by each member of the teaching staff, can now, through the use of this electronic syllabus, be computerized with multimedia contents and registered as a database.

The CCC Statistics Group will establish the experimental utilization of this electronic syllabus system in actual lectures and evaluate the types of effects of such an education arrangement. They will also standardize effective statistics education utilizing IT in conjunction with academic associations and organizations both in Japan and elsewhere, which can be used as demand courses.

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