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Paper

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A Combined Synchronous / Asynchronous System for Distributed Engineering Education

An effective and efficient distributed education system requires significant faculty participation. Faculty participation, in turn, depends on incentives for participation and the amount of work required. In order to increase participation in computer enhanced education initiatives and distributed education at Georgia Tech, we have developed a combined synchronous and asynchronous system for content delivery. Asynchronous course content creation is based on the inFusion system we developed for rapid multimedia content generation. Faculty use a very simple interface to synchronize graphics, video, and audio into a coherent presentation viewable in any browser. A portable production system can consist of as little as a laptop and a USB camera. Instructors, even with little or no previous experience with inFusion, can create effective and engaging online lectures without the need for additional production personnel. The presentation format is flexible, allowing the presenter to change backgrounds, the elements included, and the layout. This flexibility allows an instructor to tailor his presentations to his teaching style, the learning style of his students, and the material. Automatic links to supplementary material, readings, or other lectures can easily be included in the presentation. These links can change as the presentation progresses, allowing the creation of context-sensitive links to additional material.

The inFusion system allows easy creation of course content modules, which has increased faculty involvement in the creation of a large library of lecture materials. This involvement has allowed us to begin a remote master's degree program and scale it to a sustainable size in less than one year. We have also been able to generate a large library of tutorial and review content for computer enhanced courses. However, courses must also include a synchronous element. We are currently delivering synchronous courses to southeast Georgia for the Georgia Tech Regional Engineering Program (GTREP). In order to facilitate synchronous delivery, we have implemented an IP-based scalable delivery system which allows course lectures, individual office hours, and tutorial sessions to be broadcast to multiple facilities from any one of five distributed classrooms and seven group study facilities distributed across four campuses.

The GTREP program is an ideal testbed for novel distributed education methods. In this paper, we present some results for the combined approach we have developed, and outline plans for future scaling as the GTREP program expands.