International Cooperation in Ambient Computing Education

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Abstract

Funded by the US-EU Atlantis Program, the International Cooperation in Ambient Computing Education Project is establishing an international knowledge-building community for developing a broader computer science curriculum aimed at preparing students for real-world problems in a multidisciplinary, global world. The project is collaboration among Troy University (USA), University of Sunderland (UK), FernUniversität in Hagen (Germany), Universidade do Algarve (Portugal), University of Arkansas at Little Rock (USA) and San Diego State University (USA). The curriculum will include aspects of social science, cognitive science, human-computer interaction, organizational studies, global studies, and particular application areas as well as core computer science subjects. Programs offered at partner institutions will form trajectories through the curriculum. A degree will be defined in terms of combinations of trajectories which will satisfy degree requirements set by accreditation organizations. This is expected to lead to joint- or dual-degree programs among the partner institutions in the future. This paper describes the goals and activities of the project and discusses implementation issues.

Keywords: e-learning; EU-US cooperation in higher education; ambient computing; computer science education; student mobility

The project

A consortium of three US and three EU universities is currently carrying out a project entitled International Cooperation in Ambient Computing Education (ICACE) to broaden the perspective of computing students through curricular innovation and international mobility. The project is funded by The Fund for the Improvement of Postsecondary Education (FIPSE) of the U.S. Department of Education, and the Directorate General for Education and Culture of the European Commission. The consortium includes Troy University (USA), University of Sunderland (UK), Fernuniversität in Hagen (Germany), University of Algarve (Portugal), University of Arkansas at Little Rock (USA) and San Diego State University (USA). The project aims at developing and delivering a Computer Science (CS) curriculum that will give students the education needed for effectively addressing real-world problems in a multidisciplinary, global world.

The ambient computing curriculum will include aspects of social science, cognitive science, human-computer interaction, organizational studies, global studies, and particular application areas as well as core computer science subjects. Programs offered at partner institutions will form trajectories through the curriculum. A degree will be defined in terms of combinations of trajectories which will satisfy degree requirements set by accreditation organizations. This is expected to lead to joint- or dual-degree programs among the partner institutions in the future. A total of 48 students is expected to take part in the mobility scheme which will involve spending one semester (4-6 months) at one of the partner insitutions across the Atlantic.

The project's goals

The goals of the project align with the expectations of the EU-US Atlantis Program and include the following:

- To integrate multidisciplinary knowledge into current computer science courses for taught undergraduates and masters students.

- To directly influence curriculum developments in partner and other institutions by means of curriculum development teams, practical experience of student and staff exchanges and dissemination workshops. This will be furthered by staff exchanges which will provide 8-10 staff with benefits from alternative perspectives, new training materials and approaches. These will take place largely in the first half of the project as materials are redeveloped to embody a full multidisciplinary, global perspective and are made available on the electronic learning platform.

- To provide 48 students with benefits from global exchange and training activities and in addition, by means of local, national workshops and online communities of practice, spread the benefits to a further 60 non-exchange students and around 20 academics.

- To disseminate proven practices, models and study programs

Planned Activities

The planned activities cover development of international curricula, organizational frameworks for mobility, language and cultural preparation and assessment, promotion and dissemination, and evaluation.

Status of the project

The project has completed its second year, developed databases of course modules, and examined curricula to identify gaps which need to be filled. The completed sets of modules wil be turned into trajectories of modules which allow degrees to be awarded for study at different EU/US partners. Curriculum development efforts have focused on collection and standardization of curriculum descriptions, database and broker interface design and data

input and interface implementation. Partners have also started to explore how to mechanize the anticipated curricular changes within their individual institutions and some new courses have been proposed.

During the academic year of 2008-2009, five student exchanges took place involving Fernuniversität and San Diego State University. About 13 exchanges are anticipated for the academic year of 2009-2010. San Diego State University hosted the first workshop which included The Colloquium on International Engineering Education (http://icace.sdsu.edu) and the following two-day Mobile Developer Workshop on May 21 and 22, 2009 (http://mobilezone.sdsu.edu). The second workshop is planned for May 2011 in the Algarve.

A project portal has been created to bring together all academic requirements and practical information from the partner universi¬ties necessary for student mobility. This portal can be visited at http://icace.dvt.fernuni-hagen.de/ . Work has also been undertaken to build a community of practice of staff and students which will not only support staff and students on exchanges but the general academic area beyond the lifetime of the current project.

Consortium Members

USA

Emrah Orhun, Troy University, Alabama (US Project Leader)
Coskun Bayrak, University of Arkansas Little Rock, Arkansas
Yusuf Ozturk, San Diego State University, California

EU

Chris Bowerman, University of Sunderland, U.K. (EU Project Leader)
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Further information

Further information about the project can be found at the project website:
http://icace.dvt.fernuni-hagen.de/