Visions of Engineering in the New Global Economy

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Abstract

In this presentation, we first discuss the trends in the new global economy with specific emphasis on computer industry and their impact on computer education. These new trends include globalization of science including software and hardware development, the emergence of integration of computing and life sciences, interdisciplinary trends, critical needs for making systems easy to use, on time and budget, and with adequate performance. We also discuss demands on future computer scientists and engineers to possess not only technical skills, but also communication, process, and organizational skills.

We introduce the leading computer technologies today as well as research and education challenges in the areas of computer science and engineering. We present several examples of successful high tech companies and their technologies, and discuss their vision and strategies for success. We introduce our new graduate programs in computer science and engineering (both MS and Ph.D. programs) which include interdisciplinary specializations in a number of areas, including computing for life sciences, global software engineering, digital media, Internet and Web technologies, forensic and security technologies, artificial intelligence, data mining and machine learning, wireless systems, integrated embedded systems, and parallel and cluster computing.

In the second part of the presentation, we describe two our successful research projects: (1) Technologies for coastline security, a multimillion dollar, multi-year project funded by US government and (2) One pass to production, a million dollar, multi-year project, funded by Motorola, Plantation (Florida) in the area of designing modern wireless devices. In the first project, we describe the development of video and image analysis algorithms, which are embedded in the HDTV camera. These algorithms perform detection of the moving objects of interest, identify their locations, perform tracking of moving objects, and do object classification and creation of databases. In the second project, the main emphasis is in developing new tools and techniques for reducing the development life cycle of new 3G wireless systems, which include Web browsers, two-way video conferencing, Java games, video and MP3 players, and many additional multimedia features.