Computer Science Education In the Asia-Pacific Region In the 21st Century

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Abstract

Singapore aims to be the premier teaching and research centre for computer science in the Asia-Pacific region in the 21st century, and the National University of Singapore is taking steps to meet that objective. Excellence in teaching is promoted via continued efforts to secure top quality students and lecturers, promoting teaching quality, and establishing close links with industry to ensure that the graduates are able to meet changing industry needs. Research excellence is promoted by collaborations with top academic and research institutions and ensuring high quality research work by the academic staff.

Position Statement

The undergraduate Computer Science programme in the department is aimed at providing a comprehensive, practical and flexible programme geared towards meeting the needs of the Singapore IT industry, and is revised regularly based on input from various sources. Teaching emphasizes on intellectual training and the learning of basic concepts, as well as to develop analytical and problem solving methodology and skills. The curriculum is regularly updated to ensure that it is highly relevant to industry. The department also works closely with industry with the objective of providing expertise and technology transfer. Industry funded-projects include the X.25 Teleview Gateway and the External Server Provider System for Teleview with Singapore Telecom, real-time financial services software development with Chartered Electronics Industries, the Singapore Enterprise Security Architecture (SESA) project on computer security, and the Eutech project which aims at applying World-Wide Web technology for monitoring real-time control networks and accessing databases in real time.

A major challenge faced by Singapore tertiary institutions in teaching is the large student population and large class size relative to that in U.S. universities. A typical class size for a core undergraduate Computer Science course is 500-600 students, making interactive and participative teaching methods impractical. The department is currently exploring techniques to improve productivity and effectiveness in teaching. A total of over S$11 million is budgeted for teaching facilities over the next 5 years. Funding is aimed at providing a sound infra-structure, an adequate machine/student ratio, constant upgrade and maintenance, and adequate technical support.

The National University of Singapore is also taking steps to ensure an increased supply of high quality of students, both at the undergraduate and graduate level, to maintain our high standards despite increasing large student intakes. At the local level, the department aims to promote greater visibility to potential applicants from junior colleges and polytechnics. The Science Special Program for talented junior college students was initiated for this purpose. At the regional level, the department also seeks to promote its visibility and recruit quality students from prominent universities in the Asia-Pacific region such as P.R. China, India, and the Philippines.

Good teaching can only be accomplished and sustainable with good research. To this end, the department aims at grooming junior staff with potential and is actively recruiting Ph.D. graduates with proven academic and research backgrounds from top U.S. universities such as Harvard, M.I.T., and Berkeley. The department also believes in tapping talents by appointing prominent scientists as visiting professors. Over 60 foreign visitors present talks and seminars annually. A major challenge for computer science research in Singapore is the recruiting of high quality R&D manpower. The department also encourages the undertaking of multi-disciplinary research and R&D projects of impact to the research world. Currently, the department has 17 research groups with diverse research interests in areas such as artificial intelligence, multimedia networking, databases, neural networks, and theoretical computer science. Funding sources for basic research are mainly from academic research grants, the National Science and Technology Board (NSTB), and overseas bodies (eg. NSF, Europe), while funding for applied research includes the NSTB and various industries. The department aims to promote excellence in research in the 21st century and beyond and establish itself as a leading research institution in the Asia-Pacific region as well as the rest of the world.