

LESSONS LEARNED IN INDUSTRIAL AND INTERNATIONAL COLLABORATION AT THE INTEGRATED MEDIA SYSTEMS CENTER

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The Integrated Media Systems Center (IMSC) is the National Science Foundation's exclusive Engineering Research Center for multimedia and Internet research. IMSC carries out a successful cross-disciplinary program of research, education, outreach, industry and international collaboration and technology transfer. As a leader in the multimedia and Internet field, IMSC has developed unique immersive technologies, such as 3D face and body modeling, detection and animation, immersivision panoramic video technology, facial expression analysis and emotion detection, emotive speech processing, advanced information management, and multichannel immersive audio. IMSC's integrated research approach is aimed at 3D immersive environments. IMSC has 28 faculty investigators, 220 graduate research assistants, 33 undergraduate research assistants, and 15 administrative staff. IMSC's annual operating budget is approximately \$10 million.

IMSC's industry program member numbers have ranged from 20-30 members per year. Current members include FX Palo Alto, Hewlett-Packard, IBM, Intel, Lockheed Martin, Microsoft, NCR, Northrop Grumman, and smaller entrepreneurial companies. In addition to their interest in the R&D of individual technologies, industry members are interested in IMSC's multidisciplinary technology integration projects in immersive Entertainment, Education and Communication. IMSC is also conducting two additional integration projects specifically for industry members in wireless communication for engineering collaboration, and IT in the sensor-rich oil-field of the future. These projects have adapted traditional project management techniques for success in the university environment. This paper will discuss the specific lessons learned in merging industrial and academic environments.

Two additional key interests of industry-university collaborations are Intellectual Property, and excellent graduate students. Since its inception in 1996, IMSC has had 96 invention disclosures, 51 patents filed, six patents issued, 88 commercial licenses and technology transfers, and nine small company spin-offs established. This paper will discuss lessons learned in intellectual property protection without restricting publications and free-exchange of ideas, while still safeguarding industrial commercial interests. To date, 209 students have graduated with IMSC providing funding, classes, and research aspects of their education experience, including 112 with PhD, 82 with MS, and 15 with BS. Industrial feedback has been that students with a multidisciplinary educational environment are more productive on the job and sooner.

Finally, IMSC has an active program in International Collaboration, with numerous international companies among current and former members. Thrusts include research and strategic planning collaborations in Taiwan and China, Japanese entrepreneurship training, and a new multi-institute collaboration with Korean industrial and academic institutions. The paper will describe the success factors in managing international relationships.