



Cornell Heads a Revolution in Computing and Information Science

The steadily increasing availability of computational resources has had a substantial impact on all types of human activity. While engineering and science are obvious targets of application, major impacts have also been felt in communication, business, and finance. The arts and humanities have not been immune from the effects of computing. The ease of editing documents in a computational environment has taken some of the sting out of writing well. The ability to manage large arrays of numbers is bringing the same facility to still and video image recording and handling. This ready ability to edit prose, to make digital images, to control lighting systems, or to generate different three-dimensional perspectives of a structure has impacted writing, art, theater, and architecture. We are in the midst of a revolution, and Cornell is moving at the head of it.

How to exploit this revolution was the subject of a faculty task force that reported in 1999. As a result, a Faculty of Computing and Information Science (CIS) was established and is currently led by the founding dean, Robert L. Constable. This issue of *Connecting with Cornell (CWC)* discusses Computing and Information Science at Cornell. Dean Constable provides the rationale behind the action of establishing CIS and gives examples of the activity undertaken in this new academic unit. Succeeding articles provide an image of the responsibilities of the faculty participating in CIS.

The Victorian scientist, Charles Babbage, recognized as a founding father of the effort to develop computers, was supported in this work because of the need for accurate mathematical tables, particularly for navigation purposes. Making it happen, however, had to wait for the development of electronics. Bringing the cost of computing down to an affordable level so that extremely wide access to substantial resources is available has occurred only within the last 30 years as a result of large-scale integration by the semiconductor industry. In his 1997 book, *Imagined Worlds*, Freeman Dyson identified the effect of computing on scientific research as one of 22 tool-driven scientific revolutions. The computer deepens the power of physical theories to interpret experiments and make predictions. The need for high-speed communications among members of the high-energy physics community played a role in the origins of the Internet. The sociology of scientific research is changing as a result, and the style of physics and astronomy is changing as well.

This revolution is still going on. *CWC* presents discussions of the impact on biology, weather prediction, chaos theory, and combustion. Discussions of the effort in archiving physics research, in psychology and other areas, and the National Science Digital Library indicate the breadth of the current effort at Cornell. CIS is indeed an enabling technology.

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