Editorial Comments

High-performance Computing and Communications and the National Information Infrastructure: New Opportunities and Challenges

How important will high-performance, highly or massively parallel computers and high-speed communications be for biomedical purposes? The jury is still out, of course, but it is clear that the commercial sector views these developments as the leading edge of information technology. High-speed computers and communications are already being used to enhance scientific visualization, build interactive models, control remote experiments, and process high-resolution images in atmospheric science, space-based observations of earth, astronomy, geology, physics, chemistry, energy management, and environmental monitoring. One can easily see identical applications in biomedical science and health care.

It is up to the field of informatics to apply these technologies to health care research, education, and practice. Step one is to obtain Internet connections, for ourselves and for our institutions, so that remote access to high-performance machines and immense new databases, such as the "Visible Human," is possible. Our experience has shown that institutions with health sciences librarians may have the edge here. Step two is to rethink some of our assumptions about appropriate computational methods for our most important problems. New high-performance systems may well permit comparably new measurements, observations, and discoveries. Step three, to try out the new methods, will be a major challenge. Help is available in the forms of grant support and competitive access to supercomputer centers.[1]

Those who can collaborate effectively across disciplines, institutions, and sectors of society are likely to be the most successful in applying the new technologies—and in competing for available resources. The segments of the informatics community need to be connected—literally and figuratively—to each other, to other scientific disciplines, and to the rest of the biomedical and health care enterprise. The importance of these connections should be reflected in informatics training and practice. Network literacy has become essential. Telemedicine applications development and evaluation should be viewed as a new and welcome aspect of medical informatics. The ability to foster the complex alliances and organizational arrangements needed to build and maintain such wide-ranging systems has become critical to the success of our field.

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