



FRONTIERS IN COMPUTER SCIENCE RESEARCH

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Old frontiers in Computer Science continue to expand. New frontiers emerge as better theoretical understanding, dramatically improved hardware characteristics, and improved techniques for software open new vistas. Much of the excitement and drive towards new frontiers still stems from new hardware characteristics which make it possible to attack a host of new problems. Conversely, the drive to improve hardware characteristics and to utilize computer systems more effectively has presented many challenging problems for computer science and engineering.

An additional force that is creating a demand pull for advanced research in computer science is the drive in all industrial and government sectors toward greater efficiency and productivity in order to make our economy and industries more competitive internationally. Without doubt, the international challenge to our computer industry has stimulated both the private sector and the public sector toward new areas of computer science research.

To try to cover the whole range of new research in computer science in one session is overly ambitious and runs the risk of omitting important and exciting new work. Certain areas, however, deserve special attention because of the breadth and depth of their implications within computer science and outside computer science per se.

Seven subareas of computer science show significant advances and opportunities for future research. The direction and focus of interest changes with technological advances and theoretical developments. These subareas of

- . hardware research on circuits and memories,
- . software research on systems and languages,
- . theoretical research,
- . artificial intelligence,
- . robotics and automation,
- . data base research, and
- . scientific computing

are the playing field for rich interactions between academic and industrial research and development. In the past, much of the richness of the field and rapid development of the discipline has been derived from these interactions. The excitement of responding to new challenges will keep the discipline vital in the years ahead.