First IEEE Symposium on Biomedical Imaging

TECHNOLOGICAL advances in biomedical imaging are providing unprecedented opportunities for improving our understanding of biological processes and revealing the anatomical and functional organization of biological systems, from macro- to nano-scales. Research in this area is progressing at an extraordinary rate and is becoming more and more interdisciplinary. The IEEE International Symposium on Biomedical Imaging (ISBI) was initiated to bring together researchers from the medical and biological imaging communities and to provide an effective forum for multidisciplinary interactions. The first meeting was held at the Ritz-Carlton Hotel, Washington, DC, July 7–10, 2002. It was organized jointly by the IEEE Signal Processing Society (SPS) and the IEEE Engineering in Medicine and Biology Society (EMBS) and co-sponsored by National Institutes of Health's (NIH) National Institute of the Biomedical Imaging and Bioengineering (NIBIB), representing the first IEEE-NIH collaborative effort on a major imaging conference. The symposium was focused on the engineering aspects of biomedical imaging while promoting an integrative approach through all scales of observation. It successfully brought together a large group of biomedical imaging researchers and practitioners (535 participants) with different backgrounds to share their knowledge and to address the latest challenges in data acquisition, image reconstruction, image processing, analysis, and visualization.

A highlight of the symposium was the inspired opening address by Dr. Elias Zerhouni, the newly appointed director of the NIH. He stressed the importance of imaging for the biomedical sciences and expressed a strong interest in the conference. Dr. Zerhouni is very much in favor of collaborations between engineers and biomedical scientists, having experienced them first hand as a radiologist. He holds several patents related to imaging and is widely known for having introduced magnetic resonance tagging as a diagnostic tool for assessing heart function. Another noted NIH speaker was Dr. Roderic Pettigrew, who will become NIBIB's first permanent director in September 2002. He opened the first session by expressing his strong support for ISBI; he also explained the mission of NIBIB in which imaging will play a major role.

The scientific program of the conference consisted of 3 plenary talks, 10 special sessions, 19 oral sessions, and 6 poster sessions over three days. The plenary talks, one on each day, covered topics from molecular imaging (by Michael Phelps, University of California, Los Angeles (UCLA), School of Medicine), functional imaging (by Alan Koretsky, NIH), to medical image analysis (by Michael Brady, University of Oxford, U.K.). The first two talks reviewed and discussed the latest developments in imaging modalities and applications, while the latter illustrated the power and potential of image processing and analysis algorithms. The special sessions, consisting of invited papers and sponsored by NIBIB, were a unique feature of the conference. They covered a wide range of topics: "Model-Based Image Segmentation and Analysis" (organized by Christos Davatzikos), "Microarray Image Processing and Analysis" (organized by Bin Yu and Dan Bartell), "Optical Coherence Tomography" (organized by Stephen Boppart and René Salathé), "Micro Imaging" (organized by Erik Ritman and Françoise Peyrin), "Brain Connectivity and Functional Assessment" (organized by Peter Basser and John George), "Nonrigid Registration" (organized by Benoit Dawant), "Fast Acquisition and Sampling in MRI" (organized by Yoram Bresler), "Electron Microscopy" (organized by Benes Trus), "*In Vivo* Cellular and Molecular Imaging" (organized by John Hoffman and Gary Kelloff), and "Federal Funding Opportunities for Biomedical Imaging Research" (organized by Richard Swaja, NIH/NIBIB). In addition to the invited program, a total of 355 papers were submitted to the symposium, of which 73 were accepted for oral presentation and 142 for poster presentation. The acceptance rate for contributed papers was about 60%. The papers of the symposium are published in IEEE conference proceedings; they will be included in the IEEEXplore database which is searchable through the WEB.

There are many indications that ISBI fulfills a strong need of the biomedical imaging community. Many participants expressed enthusiastic support for the conference. It was felt that the time was ripe for IEEE to have its flagship conference on biomedical imaging. In charge of planning the next meeting are Christian Roux (representing EMBS) and Richard Leahy (representing SPS). It is our belief and hope that the next ISBI, to be held in Washington, DC, once again, will be even more successful in serving our community. Efforts will be made to increase the participation and the level of cross fertilization between the medical and biological imaging communities. ISBI may also play an important role in graduate education and training, as it is often impossible for a single institution to develop a comprehensive biomedical imaging curriculum covering all the modalities and applications. It is, therefore, desirable that future ISBI's include a one-day preconference event with tutorials and short courses covering not only imaging fundamentals, but also emerging technologies and applications.

In closing, we may say that ISBI was a success, partly due to timing, location, and the fact that the conference responded to a need of the engineering community. However, nothing could have happened without the hard work, creativity, and involvement of the volunteers. We would like to take this opportunity to

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thank the entire organizing committee, the program committee, the special session chairs, and the external reviewers for their large commitment of time and effort. All administrative matters were handled by the staff of both SPS and EMBS under the leadership of their executive directors, Mercy Kowalczyk and Laura Wolf. The technical program chairs were Jeffrey Fessler (for SPS) and Michael Vannier (for EMBS), with additional support provided by the special sessions chairs Erik Meijering and Jean-Louis Coatrieux and the NIBIB representative on the committee, Richard Swaja, who played a crucial role in involving the NIH. We do not know how to thank them enough for having helped us to turn what initially looked like a nice idea into a reality.

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