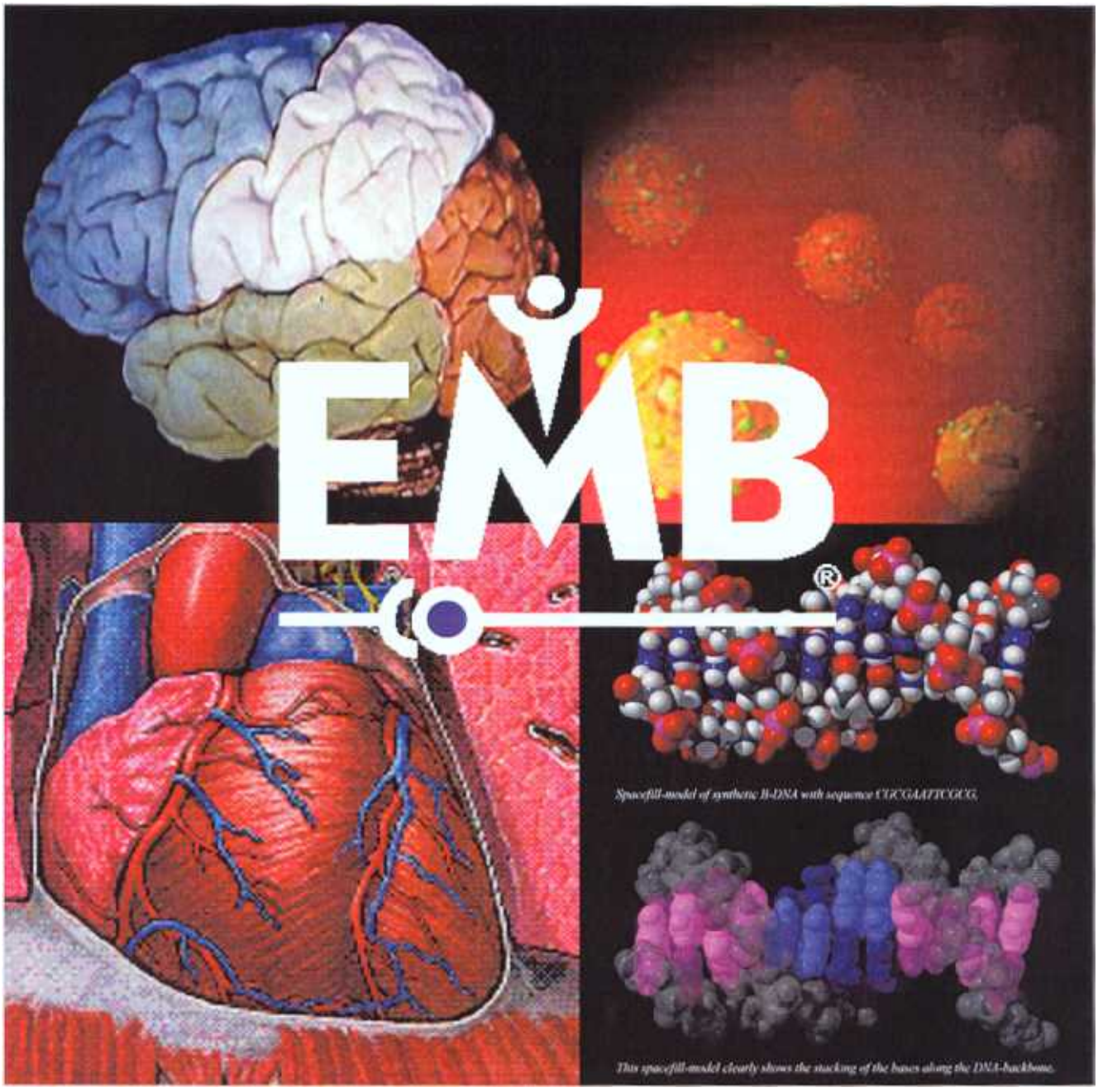
2001



Awards Ceremony
27 October 2001 Istanbul, Turkey

EMBS Members who have been Selected for the IEEE Fellows Award for 2001

Jing Bai, Beijing, China
For leadership in biomedical engineering research and education

James Duncan New Haven, CT
For contribution to medical image analysis and computer vision

Walter Jackson Freeman, Berkley, CA
For the development of biologically realistic Neuroengineering models based on noncovergent dynamics

Ramesh Mulchand Gulranjani, Montreal, Quebec Canada
For contribution to the forward and inverse problems of Electrocardiography.

Gunter A. Hofman, San Diego, CA
For research on the effects of pulsed electromagnetic fields on biological systems and to the development of innovative medical treatments based on electroportion.

Donnna Lee Hudson, Fresno, CA
For contribution to the development of techniques for computer-assisted medical decision making.

Raymond Edwin Ideker, Birmingham, AL
For enginering comtributions to the development of devices, electrodes, and stimulus waveforms for preventing and treating cardiac arrhythmias.

Robert Edward Kearney, Montreal, Quebec Canada
For contribution in understanding peripheral neuromuscular system dynamics And development of methods for the identification of biomedical systems.

George Vincent Kondraske, Arlington, VA
For contribution to the quantative understanding of human performance through modeling and the development of instrumentation.

Robert Forrest Kwasnick, Santa Clara, CA
For contribution to the development of amorphous silicon flat panel x-ray imager technology.

Rangaraj Mandayam Rangayyan, Calgery, Alberta Canada
For contribution to biomedical signal and image analysis

Shoogo Ueno, Tokyo, Japan
For contribution to biomagnetic research in localized magnetic stimulation of the brain, impedance MRI, and imaging of brain function.

William James Williams, Ann Arbor, MI
For contribution to time-varying spectral analysis.

EMBS Career Achievement Award

The 2001 EMBS Career Award is presented to John G. Webster for:

> *A career of exceptional and meritorious achievement in biomedical engineering education as exemplified by inspirational and innovative teaching and research, publication of texts, course material and writings on engineering education.*

John G. Webster received the B.E.E. degree from Cornell University, Ithaca, NY, in 1953, and the M.S.E.E. and Ph.D. degrees from the University of Rochester, Rochester, NY, in 1965 and 1967, respectively. He is Professor of Biomedical Engineering at the University of Wisconsin-Madison. In the field of medical instrumentation he teaches undergraduate and graduate courses, and does research on radio-frequency cardiac and hepatic ablation.

During his career he recognized the need for excellent tutorial materials for biomedical engineering education. He outlined these needs, motivated additional authors to fill these needs, class tested the materials, then edited the work for coherence through final production. To assist others, he posts educational and research material at http://www.engr.wisc.edu/bme/faculty/webster_john.html

He has developed 20 books, including Encyclopedia of medical devices and instrumentation (New York: Wiley, 1988), Tactile sensors for robotics and medicine (New York: Wiley, 1988), Electrical impedance tomography (Bristol, UK: Adam Hilger, 1990), Prevention of pressure sores: engineering and clinical aspects (Bristol, UK: Adam Hilger, 1991), Design of cardiac pacemakers(Piscataway, NJ: IEEE Press, 1995), Design of pulse oximeters (Bristol, UK: IOP Publishing, 1997), Medical instrumentation: application and design, Third Edition (New York: Wiley, 1998), and Minimally invasive medical technology (Bristol, UK: IOP Publishing, 2001).

Dr. Webster has been a member of the IEEE-EMBS Administrative Committee and the NIH Surgery and Bioengineering Study Section. He is a life fellow of IEEE and a fellow of the American Institute of Medical and Biological Engineering, the Instrument Society of America, and the Institute of Physics. He is the recipient of the ASEE/Biomedical Engineering Division, Theo C.Pilkington Outstanding Educator Award, the AAMI Foundation Laufman-Greatbatch Prize, the ASEE/Engineering Libraries Division, Best Reference Work Award and the IEEE Third Millenium Medal.

John G. Webster

AWARDEES

2000: Max Schaldach
1999: Fernand A. Roberge
1997: J. Lawrence Katz
1996: Max E. Valentinuzzi
1995: Floyd Dunn
1994: Wilson Greatbatch
1993: John M. Reid
1992: Edwin L. Carstensen
1991: Walter Welkowitz
1990: Richard J. Johns
1988: R. Stuart Mackay
1987: Otto Schmitt
1986: Leslie A. Geddes
1985: David B. Geselowitz
1979: Robert Plonsey *
1974: Dean L. Franklin*
1973: Donald F. Childers *
1968: Wilson Greatbatch *
1967: Herman Schwan *
1963: Otto Schmitt *
1961: Britton Chance *
1956: Edward F. MacNichol*
*recipient of the *William J. Morlock Memorial Award*

CRITERIA: The award is presented annually to an individual who has made significant contributions through a distinguished career of twenty years or more in the field of Biomedical Engineering, as an educator, researcher, developer or administrator. These contributions must represent meritorious achievement and exemplary technical, educational, or administrative accomplishment in the field. Any past or present member of the IEEE and EMBS who has not been a voting member of AdCom in the past two years is eligible. Before 1980, the award was designated as the William J. Morlock Memorial Award.

EMBS Early Career Achievement Award

The 2001 EMBS Early Career Achievement Award is presented to David Beebe for:

Significant contributions to the field of microelectromechanical systems (MEMS) and their applications in medicine and biology.

David J. Beebe is an Associate Professor in the Department of Biomedical Engineering at the University of Wisconsin-Madison with joint appointments in Electrical and Computer Engineering and Mechanical Engineering. From 1996 to 1999, he was an Assistant Professor in the Department of Electrical and Computer Engineering and an Assistant Research Professor in the Beckman Institute for Advanced Science and Technology at the University of Illinois at Urbana-Champaign. From 1994-1996, David was an Assistant Professor at Louisiana Tech University. He received the B.S. (1987), M.S. (1990) and Ph.D. (1994) in Electrical Engineering from the University of Wisconsin-Madison. From 1991-1994 David was an NIH Biotechnology Predoctoral Trainee. During that time he spent three months at Medtronic developing hemodynamic sensing concepts. David was an electrical engineer for Kimberly-Clark Corp. from 1987-1989 where he lead the packaging controls group.

Dr. Beebe has over 100 publications including publications in Science, Nature and the Proceedings of the National Academy of Sciences and four book chapters. Dr. Beebe serves on the steering/program committees for the μTAS and Hilton Head conferences and he co-chairs the Annual IEEE EMBS Special Topic Conference on Microtechnology, Medicine and Biology. Dr. Beebe has served on many government advisory panels including the NRC's National Nanotechnology Initiative review panel.

Dr. Beebe is a co-founder of Vitae LLC that is commercializing microfluidic systems for assisted reproduction and consults for various companies in the biotech and microfluidics field. Dr. Beebe is an inventor on three issued patents and five pending patent applications. David has broad interests in biomedical instrumentation and the development and use of microfabricated devices for applications in medicine and for the study of biology. Current interests include technology development for the handling and analysis of biological objects, development of non-traditional autonomous micro fluidic devices and systems, the study of cell and embryo development in microenvironments, development of electrostatic and electrocutaneous haptic displays, and the development of tactile sensors. Prof. Beebe's work has been supported by DARPA, NIH, NSF, ARO, ARL, ONR and the Whitaker Foundation.

David Beebe

AWARDEES

2000: *James Collins*
1999: Zhi-Pei Liang
1997: Metin Akay
1996: Joan E. Sanders
1995: Atam Dhawan
1993: Rory A. Cooper
1992: Yitzhak Mendelson
1991: Blake Hannaford
1990: Janie M. Fouke
1988: Yongmin Kim
1986: George V. Kondraske
1985: Kirk Shung

CRITERIA: The award is presented annually to an individual who has made significant contributions technologically or theoretically to the field of Biomedical Engineering within ten years of completion of his or her highest degree. These contributions must represent meritorious achievement, exemplary technical contribution, or educational contribution to the field as evidenced by innovative research, design, product development, patents or publications.attend an awards presentation ceremony. The awardee will be invited to publish a feature article in the EMB Magazine.

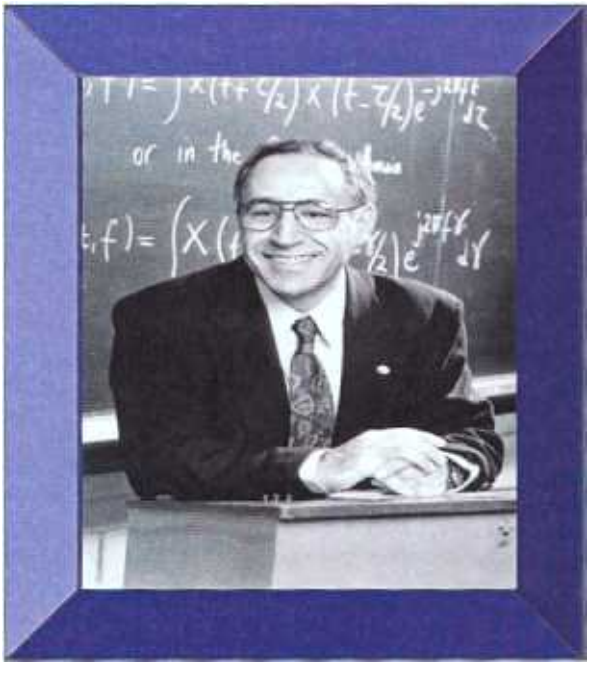
EMBS Service Award

The 2001 EMBS Service Award is presented to Metin Akay for:

Outstanding contributions to the advancement of the scientific stature and visibility of IEEE-EMBS and extraordinary dedication to the promotion of biomedical engineering education.

Metin Akay, Associate Professor of Engineering, Adj Associate Professor of Psycology and Brain Sciences, received his B.S. andM.S. in Electrical Engineering from the Bogazici University, Istanbul,Turkey in 1981 and 1984, respectively and a Ph.D. degree from Rutgers University in 1990. He is author/coauthor of the 12 books including "Theory and Design of Biomedical Instruments (Academic Press, 1991)", "Biomedical Signal Processing (Academic Press, 1994)", "Detection Estimation of Biomedical Signals(Academic Press, 1996)", "Time-Freq and Wavelets in BME (Wiley and IEEE Press, 1997)" Nonlinear Biomedical Signal Processing (Wiley and IEEE Press, 2000), Information Tech in Medicine (Wiley and Sons, 2000).He is the founding editor on Book Series in Biomedical Engineering published by the Wiley and IEEE Press, sponsored by the IEEE Engineering in Medicine and Biology Society. Dr. Akay served as the invited guest editor for 12 special issues of theIEEE EMB Mag, Annals of BME, Journal of BME in the areas of cardiovascular engineering, Virtual Reality in Medicine, Advances in Biomedical Signal Processing, Fuzzy Logic in Medicine. He is also the invited guest editor for the Proc of IEEE, the second largely cited IEEE journal, on Neural Engineering.

He was the chair of the IEEE EMBS Summer School 1997, 2001. He is also the program chair of the Annual IEEE EMBS Conference 2001and 2002. .All these activities are supported by the NSF and largely attended by the women and minorities. He received a IEEE Third Millenium Medal for his contributions to biomedical engineering research and education and the IEEE Engineering in Medicine and Biology Society Early Career Achievement Award 1997 "for outstanding contributions in the detection of coronary artery disease, in understanding of early human development, and leadership and contributions in biomedical engineering education". He also received the 1998 and 2000 Young Investigator Award of the Sigma Xi Society, Northeast Region for his outstanding research activity and the ability to communicate the importance of his research to the general public. He is also the IEEE Distinguished lecturer in Bioengineering.Dr. Akay is a senior member of IEEE, a member of Eta Kappa, Sigma Xi, Tau Beta Pi, The American Heart Association, and The New York Academy of Science. He also serves on the advisory board of several international journals and organizations and NIH study session and several NSF review panels. He has been very active in the biomedical engineering community and serve at the NIH study session and several interdisciplinary NSF panels since 1990. He has played a major role in introducing the emerging technologies to the biomedical engineering community and in promoting the world enhancement of biomedical informatics and bioengineering opportunities for women and minorities. Dr. Akay's Neural Engineering and Informatics Lab is interested in investigating the respiratory somatosensory (RSS) responses of patients with obstructive sleep apnea syndrome (OSAS) and the effect of developmental abnormalities and maturation on the dynamics of . Dr. Akay teaches interdisciplinary undergraduate and graduate courses including ``Biomedical Informatics", "Neural Networks and Computation" and "Signal Processing" at Dartmouth.



Metin Akay

AWARDEES

2000: Jack Iverson
1999: Jean Louis Coatrieux
1998: Susan M. Blanchard
1996: Michael R. Neuman
1995: Charles Robinson
1994: Barry Feinberg
1992: Swamy Laxminarayan
1990: Alvin Wald
1983: Eli Fromme

CRITERIA: The award is presented only to individuals who have made significant service contributions to the EMB Society. These contributions must represent uncommon dedication, and a record of exemplary service to the EMB society. The work cited could have appeared in the form of service as an EMBS Officer, AdCom member, editor, associate editor or society member.

EMBS Outstanding Chapter Award

There were no nominations this year for the 2001 EMBS Outstanding Chapter Award .

AWARDEES

2000: No Nominations
1999: Twin Cities
1998: Baltimore Chapter
1997: Houston Chapter
1994: Dayton Chapter
1993: Mexico Chapter
1992: Santa Clara Valley (California) Chapter

DESCRIPTION: For achievement in delivering services to members of an EMBS chapter during the previous calendar year.

CRITERIA: A single EMBS Chapter will be selected each year, based on the quality and quantity of the services provided to EMBS members in that Chapter's geographic domain. Among the documentation considered in selecting the winning chapter will be meeting reports and newsletters. The award is presented to the Chapter, whose Executive Committee determines which individual member of the chapter will travel to the Society's Annual International Conference to receive the award on behalf of the chapter.

NOMINATION: The awardee will be selected by the Member and Chapter Activities Committee of the EMBSociety. No nomination is needed.

RECOGNITION: Reimbursement of up to $1,500 (intercontinental travel) or $1,000 (intracontinental travel) for transportation and hotel accommodations at the EMBS Annual International Conference. The Chapter will be recognized at the conference's awards presentation ceremony.

EMBS Student Design Competition Award*

There were no awardees for the 2000 EMBS Student Design Competition Award.

EMBS Student Paper Competition Award*

2000 AWARDEES

1st place: Patrick La Riviere, *Dept. of Radiology, University of Chicago*
Favorable Noise Properties of Fourier-Based Approaches to Interpolation in Helical CT with Implications for 3D Visualization

2nd place: P. Mousavi *Dept. Electrical Engineering, University of British*
Classification of Human Chromosome Images Using An Iterative Centromere Segmentation Algorithm

3 place: Jeffery Kapatoes, *Dept. Medical Physics, University of Wisconsin*
The Limitations of Dose Reconstruction Without Treatment Imaging

DESCRIPTION: For outstanding student achievement on a level of international competition in the field of Biomedical Engineering.

CRITERIA: The three most outstanding student competitors at the Annual International Conference of the EMBSwill be recognized based on the quality and presentation of their research at that Conference.

NOMINATION: Student EMBS members who have submitted their papers to the student paper competition at the Annual International Conference of the IEEE EMBS, and who have already been recognized as an EMBS Whitaker Foundation Student Open Competition Finalist or as an EMBS Whitaker Foundation Student Region Finalist, are automatically considered for this award.

RECOGNITION: Cash awards of $300, $200, and $100 respectively for 1st, 2nd, and 3rd place winners.

EMBS Student Paper Competition Region Finalists

2001 FINALISTS

Elsa Angelini Columbia University **Region 1** *Quantification of Right and Left Ventricular Function with Real-Time Three-Dimensional Ultrasound*

Lee Hotraphinyo Carnegie Mellon University **Region 2** *Precision Measurement for Microsurgical Instrument Evaluation*

Mark Wachowiak University of Louisville **Region 3***Hybrid Optimization for Ultrasound and Multimodal Image Registration*

Karim Oweiss University of Michigan **Region 4** *Neural Source Localization Using Advanced Sensor Array Signal Processing Techniques*

Salih Gokturk *Stanford University* ***Region 6*** *ANew 3-D Volume Processing Method for Polyp Detection*

Adrian Chan *Institute of Biomedical Engineering* ***Region 7*** *Hidden Markov Model Classification of Myoelectric Signals in Speech*

Bram Lohman *Delft University of Technology* ***Region 8*** *A Digital Signal Processor for Doppler Radar Sensing of Vital Signs*

Jaime Heiss *Universidad de Chile* ***Region 9*** *Classification of Sleep Stages in Infants: a Neuro Fuzzy Approach*

Fumio Mase *The University of Tokyo* ***Region 10*** *Selective Stimulation and Measurement in the Cochlear Nucleus with the Spike Microelectrode Array*

EMBS Student Paper Competition Open Finalists

2001 FINALISTS

Ersin Bayram Wake Forest University School of Medicine *Confidence Based Anisotropic Filtering of Magnetic Resonance Images*

Jie Lian University of Illinois at Chicago *A Simulation and Experimental Study on Equivalent Dipole Layer Imaging of Brain Electric Sources*

Stefan Finke University of Montreal *The Reciprocal Approach to the Inverse Problem of Electroencephalography*

Huseyin Seker Coventry University *Prognostic Comparison of Statistical, Neural and Fuzzy Methods of Analysis of Breast Cancer Image Cytometric Data*

Natali Mrachacz-Kersting *Aalborg University* Reflex and Non-Reflex Torque Responses to Stretch of the Human Knee Extensors

Basak Ulker *Middle East Technical University* Implementation of a Data Acquisition System for Contactless Conductivity Imaging

Alin Achim *University of Patras* Ultrasound Image Denoising Via Maximum a Posteriori Estimation of Wavelet Coefficients

Febo Cincotti *Fondazione Santa Lucia* Brain Computer Interface: the Use of Low Resolution Surface Laplacian and Linear Classifiers for the Recognition of Imagined Hand Movements

Eran Toledo Tel Aviv University *Heart Transplantation – Spectral and Bispectral Analysis*

Dilek Goksel Bogazici University *Towards Rapid Screening of Tagged MR Images of the Heart*

Nianfeng Yang Tsinghua University *An Extending Fitts' Law for Human Upper Limb Performance Evaluation*

Hamid Gholam Hosseini Auckland University of Technology *A Multi-Stage Neural Network Classifier for ECG Events*

Gregg Suaning University of New South Wales Physiological Response in Ovis Aries Resulting from Electrical Stimuli Delivered by an Implantable Vision Prosthesis

Cameron McIntyre Case Western Reserve University *Model-Based Design of Stimulus Trains for Selective Microstimulation of Targeted Neuronal Populations*

The Engineering in Medicine and Biology Society of the IEEE advances the application of engineering sciences and technology to medicine and biology, promotes the profession, and provides global leadership for the benefit of its members and humanity by disseminating knowledge, setting standards, fostering professional development, and recognizing excellence.

The field of interest of the IEEE Engineering in Medicine and Biology Society is the application of the concepts and methods of the physical and engineering sciences in biology and medicine. This covers a very broad spectrum ranging from formalized mathematical theory through experimental science and technological development to practical clinical applications. It includes support of scientific, technological and educational activities.

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PUBLICATIONS

Engineering in Medicine and Biology Magazine
IEEE Transactions on Biomedical Engineering
IEEE Transactions on Information Technology In Biomedicine
IEEE Transactions on Neural Systems and Rehabilitation Engineering
IEEE Transactions on Medical Imaging

CONFERENCES Sponsored by EMBS

Annual International Conference of the IEEE Engineering in Medicine and Biology Society
IEEE EMBS Special Topic Conference on Information Technology in Biomedicine
IEEE EMBS Special Topic Conference on Microtechnologies in Medicine and Biology
IEEE EMBS Special Topic Conference on Medical and Biological Modeling
International Symposium on Biomedical Imaging

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