

Foreword

10th anniversary of the Biomedical Engineering Centre of the Tallinn University of Technology and of the Estonian Society for Biomedical Engineering and Medical Physics

Biomedical engineering (BME) is a fast developing interdisciplinary branch of science. It integrates physical, mathematical and life sciences and engineering principles for the study of biological, medical, and health systems and for the application of technology to improve health and quality of life. Biomedical engineering is also aimed to the creation of biologically inspired mechanisms and engineering systems. That makes this discipline highly promising, combining the complexity of biological objects with traditional engineering. Investigations in BME have been intensified around the world.

This special issue on biomedical engineering of the Proceedings of the Estonian Academy of Sciences, series Engineering, is dedicated to two events that happened in Estonia exactly ten years ago, in 1994.

- The Biomedical Engineering Centre of the Tallinn Technical University was established as a research centre for interdisciplinary studies on biomedical engineering. The Centre comprises the Chair of Radio Physics (since 1994) and the Chair of Biomedical Engineering (since 1997) as a nucleus, and also associated members.
- Estonian Society for Biomedical Engineering and Medical Physics, as an organization incorporating specialists in the fields of engineering, science, and medicine with common interest in biomedical engineering, was founded. The Society is affiliated to the International Federation for Medical and Biological Engineering (IFMBE) since 1994, to the International Organization for Medical Physics (IOMP) since 1995, and to the European Federation of Organizations for Medical Physics (EFOMP) since 1996.

It is extremely important that Estonian scientists have consolidated their efforts in the fascinating area of biomedical engineering. The solid theoretical basis in electrodynamics and mechanics and experience in bioelectromagnetism, biooptics, biosignals and biotribology forms a perspective nucleus for research in BME on international level and creates promising perspectives for various applications of medical technology.

Research team of the Centre on the interpretation of biosignals is involved in the activities of the Centre for Nonlinear Studies (CENS), a Centre of Excellence in Estonia for 2002–2006.

The BME Centre and the Society have been active in research, education and distribution of the knowledge. Let us mention some landmarks.

1996 – Estonian Programme on Biomedical Engineering, aimed to fundamental research and applications as well as to education, was started.

1996 – The Satellite Symposium of the 10th Nordic–Baltic Conference on BME was held in Tallinn.

1997 – A study program “Electronics and Biomedical Engineering”, including BSc, MSc and PhD curriculums, started at TTU.

1999 – The 11th Nordic–Baltic Conference on BME, a Regional Conference of the IFMBE, IOMP and IEEE Engineering in Medicine and Biology Society, was organized in Tallinn.

2002 – MSc and PhD programs on BME and Medical Physics were developed in the framework of the new system of higher education in Estonia; the programs follow recommendations of the Bologna Declaration and Tempus S-Jep-12402-97 project “Baltic Biomedical Engineering and Physics Master Courses 1998–2000”, aimed to the reconstruction of education in BME and medical physics in the Baltic States.

2003 – The BME Centre and the Society were represented at the inauguration meeting of the European Alliance for Medical and Biological Engineering and Science (EAMBES).

2004 – BSc specialization on medical physics started in the study program of technical physics.

This special issue on biomedical engineering includes papers of our colleagues from EAMBES as well as of Estonian scientists on three main topics: cardiovascular diagnostics, EEG signals in anaesthesiology and electromagnetic field effect on the nervous activity.

As a guest editor I am thankful to all the authors, reviewers and editors for excellent cooperation.

Hiie Hinrikus