



Name of the Institution:
Department of Biomedical, Electronic and Telecommunication Engineering
(DIBET)
UNiversity Federico II of NAPles (UNINA)

Web:
www.ingbiomedica.unina.it
www.international.unina.it

Name of the TEMPUS CRH-BME representative: **Prof. Marcello Bracale**

BME GROUP/LABORATORY PRESENTATION

The University of Naples Federico II was established in 122. It was the first publicly funded university in Europe. Student enrollment nears 97,000 and the academic personnel, at this time, is 3,121. The university is made up of 3 divisions (Poli): Pole of Science and Technology, Pole of Life Sciences, Pole of Social and Human Sciences. UNINA is organized into 13 schools and 82 departments grouped, within each division, according to academic and research profiles.

The Department of Biomedical, Electronic and Telecommunication Engineering (DIBET) of the University of Naples "Federico II" has several groups operating in the field of microelectronics, signal processing, microwaves, telecommunication, biomagnetism, lasers, bioengineering and telematic applications. The manpower of the Department consists in more than 50 members (Professors, Associate Professor, Researchers, Technicians and Administrative employees)

The Biomedical Engineering Unit at the University of Naples is active since 1966. Its main research activities in biomedical instrumentation, biomedical signal and image processing, multimedia for education and telemedicine. The MBE group actually involved in the TEMPUS Project are: Prof. Marcello Bracale; Dr. Mario Sansone, Dr. Leandro Pecchia, Paolo Melillo. Following a brief biography.



Marcello Bracale was born in Naples, Italy and received his laurea degree in 1963. Since 1976 he was full professor in Applied Electronics and from 1980 in Biomedical Engineering at the University Federico II of Naples, Italy. He was involved in a number of academic and professional collaborations with both University and private companies. With the DIBET he was scientific responsible of several national (FIRB INTESA, POR CAMPANIA RHM) and international (INTERREG INTERMED, INTERREG INTRAMEDNET and TEMPUS CRH-BME) research projects. His main fields of scientific and professional interest are: electronic and biological instrumentation; biosignal and data analysis; health care system management; health telematics and telemedicine. At present he is author and co-author of 350 publications. Prof. Bracale is the General Secretary of the "Associazione Italiana di Ingegneria Medica e Biologica" (AIIMB), from 1986 to 1991 he was Chairman of the Developing Countries Committee and the National Secretaries Committee of International Federation of Medical and Biological Society (IFMBE). In 2002 was member of the IFMBE in the UN Economic and Social Council at the United Nation (Vienna). He was member of Councilor in Clinical Engineering for Developing Countries of WHO, and consultant of Italian Ministry of Foreign Affairs. He was nominated Professor Honoris Causa at the Technical University of Cluj Napoca (Romania) Faculty of Electronic Engineering.



Mario Sansone took PhD in Bioengineering at the University of Bologna, Italy, in 2000. He is currently Assistant Professor at the University "Federico II" of Naples, Italy. His main interests are: statistical processing of medical images, modelling of physiological processes, biomedical signal processing. Dr. Sansone is reviewer for several Journals, such as Medical & Biological Engineering & Computing, and member of the scientific committees of few International Conferences. He is member of Italian Association of Medical and Biological Society (AIIMB) and of International Federation of Medical and Biological Society (IFMBE).



Leandro Pecchia was born in Naples, Italy and received at the University Federico II of Naples his laurea degree in electrical engineering, with a specialization in biomedical engineering, in 2005 and the Ph.D. in health economy in 2009. From 2005 to 2010, he was involved in a number of academic and professional collaborations with both University and private companies. With the Department of Biomedical, Telecommunication and Electrical Engineering (DIBET) of University Federico II of Naples, he participated to several national (FIRB INTESA, POR CAMPANIA RHM) and international (INTERREG INTERMED, INTERREG INTRAMEDNET and TEMPUS CRH-BME) research projects. During his research activities he cooperated with several Universities in Cyprus, Croatia, Greece, Slovenia and United Kingdom. He has authored or coauthored about 30 journal and conference papers in the fields of data mining, telemedicine, health technology assessment, and medical informatics. Dr. Pecchia is member of Italian Association of Medical and Biological Society (AIIMB), of National Commission on Biomedical Engineering (NCBE), of International Federation of Medical and Biological Society (IFMBE).



Paolo Melillo was born in Naples on 29th June 1985. He received the B.Sc. degree in information engineering and the M.Sc. degree in biomedical engineering with honours from The University of Naples "Federico II", Italy, in 2006 and 2008, respectively. He is now Ph.D. student at the Department of Biomedical, Telecommunication and Electronic Engineering of the University of Naples "Federico II", Italy. His research interests include data-mining applied to health information, signal processing, health management and telemedicine. Mr Melillo is member of Italian Association of Medical and Biological Society (AIIMB), of International Federation of Medical and Biological Society (IFMBE) and of the Italian Mathematical Union.

BME EDUCATION

- ✓ Since 1991, UNINA offered a five-year laurea degree in BME, as a specialization of the Degree in Electronics Engineering.
- ✓ Actually, UNINA host the BSc (since 2003) and the MSc (since 2006) in Biomedical Engineering.
- ✓ Bioengineering PhD courses were activated in 1982 as consortium of various Universities with two administrative headquarters in Milan and Bologna, while since 2001 a PhD course in "Healthcare Economics and Management", is running in UNINA as a collaboration among the Faculties of Medicine, Economy and Engineering.

COURSES AVAILABLE IN ENGLISH? (IF YES, ON WHICH LEVEL?)

- | | | |
|--------|----------|----------|
| • BSc: | • MSc: 2 | • PhD: 2 |
|--------|----------|----------|

ECTS: Total number

- | | | |
|--------|----------|----------|
| • BSc: | • MSc: 9 | • PhD: - |
|--------|----------|----------|

BILATERAL AGREEMENTS WITH OTHER UNIVERSITIES? (LIST THOSE UNIVERSITIES)

- University of Patras, Greece
- Reykjavik University, Island
- GR. T. Popa - University of Medicine and Pharmacy, Romania
- Universidad Politecnica de Madrid, Spain
- Maastricht University, Nederland

MAIN BME INTERESTS

- ECG, EMG, EOG signal processing
- Assessment and control of cardiac pacemakers
- Clinical evaluation of HRV in myocardial infarction
- Medical imaging and Functional MRI
- 3D CAD system orthopaedic preoperative planning
- Telemedicine and Home Care
- Technology Assessment and Clinical Engineering

ACTIVE PROJECTS

National

- ISLAND PROJECT
- FIRB-INTESA
- Telemedicina Regione Campania
- Remote Health Monitoring

International

- TELEPLANS
- INTRAMEDNET
- INTERMEDNET

RECENT PUBLICATIONS (LAST 2 YEARS)

- ✓ L. Pecchia, F. Schiraldi, S. Verde, E. Mirante, P.A. Bath, M. Bracale. Evaluation of Short-term effectiveness of the disease management program "Di.Pro.Di." in continuity of care of patients suffering from congestive heart failure, Journal of the American Geriatrics, 2010, Vol. 58, Issue 8, pp: 1603-1604. [Wiley-Blackwell (Malden 02148, Ma), DOI: 10.1111/j.1532-5415.2010.02985.x];

- ✓ L. Pecchia, P. A. Bath, N. Pendleton, M. Bracale. "Web-based system for assessing risk factors for falls in community-dwelling elderly people using the analytic hierarchy process", *International Journal of the Analytic Hierarchy Process*, 2010, Vol. 2, Issue 2, pp: 135-157. [Creative Decisions Foundation (Pittsburgh, PA, USA), Available on line: <http://www.ijahp.org>]
- ✓ L. Pecchia, P. Melillo, M. Sansone, M. Bracale "Discrimination power of short-term heart rate variability measures for CHF assessment", *IEEE Transaction on Information Technology in Biomedicine*, 2011, Vol. 15, Issue 1, pp: 40-46. [IEEE (Piscataway, NJ, USA), DOI: 10.1109/TITB.2010.2091647];
- ✓ P. Melillo, R. Fusco, M. Sansone, M. Bracale, L. Pecchia. "Discrimination power of long-term heart rate variability measures for CHF assessment", *Medical & Biological Engineering & Computing*, 2011, Vol. 49, Issue 1, pp 67- [Springer, (Heidelberg, Germany), DOI: 10.1007/s11517-010-0728-5].
- ✓ L. Pecchia, P. Melillo, M. Bracale "Remote Health Monitoring of heart failure with data mining via CART method on HRV features" *IEEE Transaction on Biomedical Engineering*, 2011, Vol. 58, Issue 3, pp: 800-804 [IEEE (Piscataway, NJ, USA), DOI: 10.1109/TBME.2010.2092776];
- ✓ L. Pecchia, PA Bath, N. Pendleton, M. Bracale "Use of the analytic hierarchic process (AHP) for examining healthcare professionals' assessments of the relative importance of risk factors for falls in community-dwelling older people." *Methods of Information in Medicine* [Schattauer (Stuttgart, Germany), accepted: 25.10.2010, status: preprint on line , DOI: 10.3414/ME10-01-0028];
- ✓ U. Bracale, M. Rovani, M. Bracale, G. Pignata, F. Corcione, L. Pecchia, "Totally laparoscopic gastrectomy for gastric cancer: meta-analysis of short-term outcomes", *Minimally Invasive Therapy & Allied Technologies* [Taylor & Francis (Oslo, Norway), Accepted 28th of April 2011]; M. Sansone, L. Mirarchi, M. Bracale. Adaptive removal of gradients-induced artefacts on ECG in MRI: a performance analysis of RLS filtering, *Medical & Biological Engineering & Computing*, 2010, Vol. 48, Issue 5, pp 475-482 [Springer, (Heidelberg, Germany), DOI: 10.1007/s11517-010-0596-z]
- ✓ L. Pecchia, L. Mirarchi, P. A. Bath, R. Doniacovo, M. Bracale, Health Technology Assessment via Analytic Hierarchy Process. A case study: choosing the maintenance contract for a CT. *Mediterranean Conference on Medical and Biological Engineering (MEDICON) 2010, Chalkidiki (Greece), 27-30 May 2010. IFMBE Proceedings: 1-4.*
- ✓ L. Pecchia, P. Melillo, M. Sansone, M. Bracale. Heart Rate Variability in healthy people compared with patients with Congestive Heart Failure. *International Conference on Information Technology in Biomedicine (ITAB 2009)*, November 5-7, 2009, Larnaca, Cyprus. *Electronic proceedings: 1-4.*
- ✓ L. Pecchia, G. Carpino, L. Mirarchi, M. Bracale, The preservation of the CE mark for a medical device further to a maintenance process. *International Conference on Information Technology in Biomedicine (ITAB 2009)*, November 5-7, 2009, Larnaca, Cyprus. *IEEE Electronic proceedings: 1-4.*
- ✓ L. Pecchia, U. Bracale, M. Bracale. "Health Technology Assessment of Home Monitoring for the Continuity of Care of patient suffering from congestive heart failure", *IFMBE Proceedings*, 1, Volume 25/12, *World Congress on Medical Physics and Biomedical Engineering*, September 7 - 12, 2009, Munich, Germany, Pages 184-187
- ✓ L. Pecchia, L. Mirarchi, R. Doniacovo, M. Bracale. "Health Technology Assessment for a Service Contract: a new method for decisional tools". *IFMBE Proceedings*, 1, Volume 25/12, *World Congress on Medical Physics and Biomedical Engineering*, September 7 - 12, 2009, Munich, Germany, Pages 105-108.
- ✓ P. Melillo, L. Pecchia, M. Bracale. Interactive Voice Response System for home telemonitoring of heart failure patients". *IFMBE Proceedings*, 1, Volume 25/5, *World Congress on Medical Physics and Biomedical Engineering*, September 7 - 12, 2009, Munich, Germany, Pages 153-156.
- ✓ L. Pecchia, P. A. Bath, N. Pendleton, M. Bracale. AHP and risk management: a case study for assessing risk factors for falls in community-dwelling older patients. *ISAHP 2009 Symposium*, July 29–August 1, 2009, Pittsburgh, Pennsylvania, USA. *Proceeding: 1-15.*
- ✓ L. Pecchia, U. Bracale, P. Melillo, M. Sansone, M. Bracale. AHP for Health Technology Assessment. A case study: prioritizing care approaches for patients suffering from chronic heart failure. *2009 Symposium*, July 29–August 1, 2009, Pittsburgh, Pennsylvania, USA. *Proceeding:1-8.*

COLLABORATION WITH OTHER INSTITUTIONS (OPTIONAL)

Universities:

- ✓ *Prof. Nicolas Pallikarakis*, Medical School, University of Patra, Greece
- ✓ *Prof. D.D. Koutsouris*, Institute of Communication And Computer Systems, Atene, Gr
- ✓ *Prof. Pattichis Constantinos*, Department of Computer Science, Univ. of Cyprus
- ✓ *Prof. Eleni Kaldoudi*, School of Medicine, Dragana, Alexandroupolis, Greece
- ✓ *Prof. P. Bath*, University of Sheffield, Sheffield, UK.
- ✓ *Dr. Neil Pendleton*, University of Manchester, Manchester, UK.
- ✓ *Prof. T. Saaty*, University of Pittsburgh, Pittsburgh, PA, USA

Research Centers:

- ✓ IRCS Fondazione Pascale, Naples, Italy.

Medical Institutions:

- ✓ *Prof. Bruno Trimarchi*, *Prof. Nicola De Luca*, Dot. Luigi Argenziano, Dipartimento di Medicina Clinica, Scienze Cardiovascolari ed Immunologiche, Università Federico II di Napoli
-

-
- ✓ *Prof. Giusto Pignata*, Dot. Umberto Bracale, Ospedale S.Camillo, Trento, Italia.
 - ✓ *Prof. Fernando Schiraldi*, Dot. Sossio Verde, Intensive Care Unit, Public Hospital San Paolo, Azienda, Sanitaria Locale Napoli 1 Nord, Naples, Italy

Other:

- ✓ *Prof. L. Mirarchi*, Siemens Medical Solutions, Milano, Italia
 - ✓ *Dr. Francesco Acanfora*, ARTS srl
-