

University of Salento in Lecce Research Unit

Contact: Luciano Tarricone

Laboratory: Department of Innovation Engineering

Telephone: +39 0832 297226

Fax: +39 0832 1830127

E-mail: Luciano.tarricone@unisalento.it

The team is active in many different lines of research which range from the interaction between EM fields and the environment to the design of antennas and microwave circuits, also through the study of new concept materials, intelligent wireless systems and, more generally, to EM-enabling technologies for tomorrow's internet. The group has the use of an advanced computing laboratory (even for grid computing) and an EM measurement laboratory. The team supports all the EM education for the Engineering Faculty of the University of Salento in Lecce.

Research objectives

Numerical Dosimetry

The group has developed a proprietary parallel FDTD code, with variable-mesh features (VM-FDTD) allowing for an exact solution, in a reasonable time period, of the problem of human exposure to complex EM sources. One of the main activities is the setting-up of novel optimum algorithms for SAR estimation.

Bioelectromagnetic Interactions

BioEM interactions are studied at different time and space scales. Different approaches are required, appropriate to the different levels and they need to be harmonised to a single methodological path. Whilst at whole-body level the FDTD approach is suitable, stochastic Markov models are used at a microscopic level. The combination of FDTD models and Markov models at a macromolecular scale is an example of model integration for the complete bioEM categorisation of the response of biological systems to EM simulation.

Biomedical Applications

The group's skills are used to good effect on biomedical issues. One example is the study of the adoption of intelligent wireless systems, based also on ontology, in a hospital environment or for remote healthcare. Another example is the study of RFID technologies in the drug industry and of the possible interaction between drugs and RFID EM fields.

People belonging to the team:

Luciano Tarricone, Professor, luciano.tarricone@unisalento.it

tel: (+39) 0832-297226

Luca Catarinucci, Researcher, luca.catarinucci@unisalento.it

tel: (+39) 0832-297278

Luigi Patrono, Researcher, luigi.patrono@unisalento.it

tel: (+39) 0832-297226

Giuseppina Monti, Research Fellow, giuseppina.monti@unisalento.it

Alessandra Esposito, Research Fellow, alessandra.esposito@unisalento.it

Rosa De Paolis, Temporary Researcher, rosa.depaolis@unisalento.it

Laura Corchia, Temporary Researcher, laura.corchia@unisalento.it

Fabrizio Congedo, Temporary Researcher, fabrizio.congedo@unisalento.it

Marco Zappatore, Postgraduate, marcozappatore@unisalento.it

Danilo De Donno, Postgraduate, danilo.dedonno@unisalento.it
Sergio Guglielmi, Postgraduate, sergio.guglielmi@unisalento.it
Paola Arcuti, Postgraduate, paola.arcuti@unisalento.it
Riccardo Colella, Temporary Researcher, riccardo.colella@unisalento.it

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