



University of Pavia

Ph.D. School of Electrical and Electronics Engineering and Computer Science

SEMINAR

Finite Difference Time Domain for antenna optimal design and biological applications

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Abstract: The Design of wearable antennas for which there are no closed-form design formulas is a complex optimization process which involves selecting a geometry type first and then choosing parameter values of this geometry and its materials (e.g. dielectric constant of the antenna substrate), so that the design criteria are satisfied. In antenna design, various measures of the antenna performance can be incorporated in the objective function, such as radiation patterns and/or impedance matching. Various computational electromagnetics codes can be used to calculate these antenna characteristics, implementing finite element, finite difference or boundary element methods.

The design process can be significantly reduced by the use of evolutionary optimization process together with Finite Difference Time Domain simulator for computation of the objective function based on some antenna characteristics. The use of Graphical Processor Unites makes it feasible in an acceptable time in the order of several hours. The possible application of this are wearable antennas and Wireless Body Area Networks used for patients monitoring.

Bio: Łukasz Januszkiewicz obtained a B.Sc.(Eng) degree and then his Ph.D. degree in 2008 from Lodz University of Technology, Poland for research related to the antenna and wireless system design. He is a researcher and academic teacher now in Institute of Electronics in Lodz University of technology. His research interests focus on wearable antenna design and Wireless Body Area Networks. In the last years he is involved in research on antenna optimal design carried together with Prof. Paolo Di Barba from University of Pavia.

Organizer

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