Association des Doctorants du campus STIC

Séminaires doctorants 12

04 avril 2007

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Ultra Wide Band Antennas for Impulse Systems

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Abstract. Recent years have seen an increased interest in Ultra Wide Band technology for different applications such as communications, radar, or localization. This talk presents why efficient, characterized antennas for these impulse systems are needed, and how they can be designed. Conventional antenna description is first reminded and a state of the art of UWB antennas is proposed. A bow-tie structure is chosen for optimization. A novel triangular CPW-fed printed antenna is then presented. This shape allows a 50Ω impedance matching, an omnidirectionnal radiation pattern, a limited size, and a low cost. A second work has been carried out on the shape of the antenna ground planes, in order to obtain more constant radiation patterns with respect to frequency. Temporal measurements were also necessary in order to characterize the antennas and validate these evolutions. The procedure and data processing are first presented and validated. Antenna transmit and receive transfer functions are differentiated. Radiated signal can then be computed in different directions when a reference pulse is applied to the antenna input.

Tools and Methods for System Level Architecture Exploration

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Abstract. The increase of the complexity of systems leads designers to reconsider design methodologies. Due to the size of current systems, modeling of whole system in a single global step became too complex. The decomposition in different IP's is a good way to make the design easier and also increase the IP reuse. However, design and simulation of the whole system is so important to check total coherence, that this time consuming step is essential. Mainly for this reason it is necessary to increase abstraction level. But, in order to achieve a powerful architecture exploration, the definition of model must be as accurate as possible. A balance must be found between speed of the simulation and accuracy of the model.
The purpose of this work is to study and develop methods able to evaluate critical choices (at system level) of hardware/software architecture and to propose modifications of this architecture in order to satisfy as well as possible the objectives and the constraints of the system. Also making sure that the solutions resulting from this exploration are "robust" with respect to the refinement of the solution in the process of design.

Inverse Problems and Time Reversal in Electromagnetics: an Introduction

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Abstract. Almost every problem can be seen under two ways: the direct and the inverse one. Putting labels is (almost) a matter of convention; the easier problem is usually called "direct", letting the other term for the most difficult (and interesting) version. This is an introductory talk, assuming no special mathematical background. In a first part, inverse problems are informally defined and several simple, demystifying examples are presented [1]. Emphasis is then given to applications in electromagnetic problems. In the second part, the time reversal (TR) method [2] is presented, together with some recent results in microwave imaging [3].

References

1. Groetsch, C.W.: Inverse problems: activities for undergraduates. The Mathematical Association of America, Washington, DC (1999)
2. Fink, M., Cassereau, D., Derode, A., Prada, C., Roux, P., Tanter, M., Thomas, J.L., Wu, F.: Time-reversed acoustics. Reports on Progress in Physics **63** (2000) 1933–1995
3. Chatelée, V., Dubois, A., Aliferis, I., Dauvignac, J.Y., El Yakouti, H., Pichot, C.: Time reversal imaging techniques applied to experimental data. In: Proceedings of the Mediterranean Microwave Symposium (MMS 2006), Genova, Italy (2006)

Notes

Les séminaires doctorants

Les séminaires des doctorants STIC permettent aux futurs docteurs d'échanger leurs expériences dans leur travail de thèse, tant sur le plan scientifique que sur le plan professionnel et éducatif. Ces rencontres ont lieu mensuellement dans l'un des laboratoires STIC de Sophia Antipolis.

Un séminaire est l'occasion de trois à quatre interventions, dont une effectuée par un jeune permanent. Chaque intervention comporte un exposé technique d'une vingtaine de minutes et une période d'échanges et de retours d'expérience d'une dizaine de minutes.

Ces actes compilent les résumés en anglais des exposés techniques du séminaire doctorant du 04 avril 2007.

L'ADSTIC

L'ADSTIC est l'association des doctorants du campus sciences et techniques de l'information et de la communication de l'université de Nice Sophia Antipolis. Créée en 2004, l'ADSTIC est une association loi 1901.

Notre but essentiel est de faciliter les contacts entre les doctorants des différentes disciplines présentes sur le campus STIC, de les informer et de valoriser leur formation doctorale. L'ADSTIC se veut aussi un lien entre les doctorants passés, actuels et futurs...

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