Department of Electrical & Computer Engineering
The University of Akron

Monday, 2 July 2012
ASEC – S 223
3:00 – 4:30 PM

Application of Method of Moments to Computational Electromagnetic Engineering

Sadasiva Rao, Ph.D.
Naval Research Laboratory
Washington D.C. 20375

ABSTRACT

In this talk, an overview of the method of moments (MOM) solution procedure using the well-known Rao-Wilton-Glisson (RWG) functions, as applied in the computational electromagnetic engineering area is presented. Several important application problems accommodating diverse areas of research are outlined. Next, a new solution procedure is presented that extends the conventional MOM scheme to electrically large bodies. In this scheme, the surface of the body is initially divided into smaller sub-structures. By defining a set of new basis functions adaptively, utilizing the primary RWG functions, we develop a solution scheme, which eliminates the interaction of one substructure with neighboring substructures. This procedure enables to solve the complete problem with an iterative solution, involving at most two or three iterations, as a final step. A few representative numerical examples are presented to illustrate the applicability of the new method.

About the Speaker: Sadasiva M. Rao received the Bachelors degree in electrical communication engineering from Osmania University in 1974, Masters degree in microwave engineering from Indian Institute of Sciences in 1976, and Ph.D. degree with specialization in electromagnetic theory from University of Mississippi in 1980.

Dr. Rao worked extensively in the area of numerical modeling techniques as applied to Electromagnetic Scattering. He and his team at the University of Mississippi, were the original researchers to develop the planar triangular patch model and to solve the problem of EM scattering by arbitrary shaped conducting bodies. For this work, he received the best paper award for the period 1979 - 1981 from SUMMA Foundation. He published/presented over 150 papers in international journals/conferences. He was awarded the status of Fellow of IEEE in 2000. Further, Thomson ISI recognized him as a HIGHLY CITED RESEARCHER in 2001. His research interests include acoustic and electromagnetic scattering, antenna analysis, numerical methods, and other related fields.

If you have any questions, please contact ssastry@uakron.edu.