



**IEEE Southeastern Michigan Section
Spring Section Conference & Dinner
Wed, April 2, 2008, 5pm – 9pm
Fairlane Center, University of Michigan – Dearborn
19000 Hubbard Drive, Dearborn, MI 48128
CHAPTER IV (AP, MTT, ED Societies) and
CHAPTER VI (GRS Society)**



"Overview of Image-Based Near Field-to-Far Field Transformations (NFFFTs)"

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Abstract:

As anyone familiar with electromagnetics knows, the scattering behavior of a body is significantly different in the far field as compared to the near field. There are many instances in which we would like to know the far field scattering behavior of a body, but available resources can only support a near field

measurement. For example, the far field distance of a nominal automobile-sized object is hundreds or even thousands of meters at UHF and microwave frequencies, which greatly exceeds the dimensions of most measurement facilities. Electromagnetic theory tells us that we need a complete set of near field bistatic measurements to exactly determine the far field scattering behavior of a body. A full set of bistatic measurements is not practical, leading to the need for an alternative approach to extrapolate far field scattering behavior from available near field measurements.

Our group has a 23-year history of developing a variety of near field-to-far field transformations (NFFFTs) for predicting the far field RCS of targets from monostatic near field measurements. The most practical and mature of these techniques is based upon the reflectivity approximation commonly used in synthetic aperture radar (SAR) imaging, in which multiple interactions are neglected. We use the term "image-based" to describe such NFFFTs and their relation to SAR imaging. In this presentation we will introduce image-based NFFFTs and then cover the development and performance of a specific image-based NFFFT based upon a circular collection geometry common in indoor and outdoor measurement facilities.

Speaker's Biography:

Scott Rice received his BSEE from Michigan State University in 2000 and his MSEE from the Ohio State University in 2002 with a focus on electromagnetics and signal processing. Since 2002 he has been employed by General Dynamics Advanced Information Systems (formerly Veridian/ERIM) and has authored or co-authored five papers and conference proceedings covering image-based NFFFT techniques. His 2006 paper presented at the Antenna Measurements and Techniques Association provided a theoretical development for a circular NFFFT based upon an arc measurement instead of a complete circle, and was selected by the conference as that year's best technical paper and re-printed for a wider audience in the AMTA Corner of the June 2007 IEEE A+P magazine. When not occupied with his career, Scott has additional interests in amateur radio, foreign languages, and teaching swing dancing.

Evening Schedule:

- 4:30pm – 5:00pm Registration and Check-In
- 5:00pm – 5:45pm First half technical sessions, seven parallel sessions for chapter speaker
- 5:45pm – 6:00pm Vendor exhibition and networking
- 6:00pm – 6:45pm Second half technical sessions, seven parallel sessions for chapter speaker
- 6:45pm – 7:15pm Vendor exhibition and networking
- 7:15pm – 8:00pm Buffet Dinner from Park Place Catering
- 7:30pm – 8:00pm Awards program during dinner
- 8:00pm – 9:00pm Keynote speaker

You get your choice of two (2) of the fourteen technical session, plus networking, vendor showcases, dinner and the keynote speaker.

Registration will be online beginning in February at <http://www.ieee-sem.org>.: \$25 for IEEE Members (including members of other ESD Affiliate Council Societies), \$30 non-members, \$10 students/retirees/unemployed. Location is: 19000 Hubbard Drive, Dearborn, Fairlane Center Building, University of Michigan – Dearborn. This event is a technical and professional service to the local IEEE members – this is not a "fundraiser". Contact: Prof. Chris Mi (mi@ieee.org), Conference Chair.