SEMINAR NOTICE

Department of Electrical and Systems Engineering

Electromagnetic Tracking for Medical Imaging

MS Dissertation Defense

Jie Wen
MS Candidate
Department of Electrical and Systems Engineering
Washington University in St. Louis

Abstract: This thesis explores the novel use of a wireless electromagnetic (EM) tracking device in Computed Tomography (CT) environment. The sources of electromagnetic interference inside a Philips Brilliant Big Bore CT scanner are analyzed. A research version of the Calypso wireless tracking system was set up inside the CT suite, and a set of three Beacon transponders were bonded to a plastic fixture. The tracking system was tested under different working parameters including orientation of tracking beacons, the gain level of the sensor array, the distance between the transponders and the sensor array, the rotation speed of the CT gantry, and the presence/absence of the CT X-ray source. The performance of the tracking system reveals two obvious factors which bring in electromagnetic interference: 1) metal like effect brought in by carbon fiber patient couch and 2) electromagnetic disturbance due to spinning metal inside the CT gantry. The accuracy requirements for electromagnetic tracking in the CT environment are a Root Mean Square (RMS) error of <2 mm in stationary position tracking. Within a working volume of 120×120×120 mm^3 centered 200 mm below the sensor array, the tracking system achieves the desired clinical goal.

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10:30 a.m.
Jolley, Room 306

Research Advisors:
Professor Joseph O'Sullivan
Professor Parag J. Parikh

This seminar is in partial fulfillment
of the Masters Degree

Washington University in St. Louis
School of Engineering & Applied Science