SEMINAR NOTICE

Preston M. Green Department of Electrical and Systems Engineering

Real-time Image Processing on an FPGA for an Intraoperative Goggle Device

MS Dissertation Defense
By

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Abstract: The emergence of near-infrared dyes for fluorescence imaging has had a tremendous impact in the medical field. In particular, indocyanin green (ICG) has been widely used for assessing tumour margins during intraoperative procedures. Typically, the dye is intravenously injected into the patient, and after 24 hours the dye is removed from the patient‘s body, except where binding between the dye and tumour cells have occurred. This selective binding between ICG and cancerous tissue allows for easy and accurate detection of cancer margins as well as detection of metastasis throughout the patient‘s body. In order to detect the binding sites, a near infrared light source at 780nm is used to excite the dye molecules, and emission is observed at 800nm. To take advantage of fluorescent imaging during intraoperative procedures, we have developed a goggle system equipped for real-time imaging in both the visible and near infrared spectrum. The goggle system has to be light, compact and performs real-time image processing to assist the physician for easy detection of tumor margins. To this end, I have developed Verilog code for a Spartan III FPGA that performs the following: 1) Real-time acquisition of both visible and near infrared spectrum images ix from a pair of CMOS imaging detectors; 2) Real-time image processing for both near infrared and color images in order to enhance the captured information; and 3) Real-time display of fused visible-near infrared images in high definition (HDMI) format to a goggle device..

DATE: Friday, February 28, 2014
TIME: 1:00 p.m.
PLACE: Green Hall, Room 0120

Research Advisor:
Dr.Viktor Gruev

This seminar is in partial fulfillment
of the Masters Degree

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