

SPRING 2006 SEMINAR SERIES

Date: Thursday, April 6, 2006

Time: 11:00 am - 12:00 pm

Room: SL 165

Reception at 10:45 am (cookies and refreshments served)
Everyone is invited

**Modeling and Control of Electrophotography: From Artifact Reduction
to Signature Embedding**

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Abstract. The final output quality (print/image quality) for any imaging system depends on the close integration among process control, image processing and understanding human visual perception. Electrophotography (EP) is the basic imaging process used in copiers and laser printers. The EP process is also being investigated as a viable process option for fabricating organic/polymer electronics. Recently, it has been the technology of choice for the short run digital press market. Banding is one of the most visible and studied artifacts for the EP process. We have been working on various techniques to reduce banding in EP processes for the past 8 years. In this talk, I will start by summarizing some of our recent work in banding reduction for color EP processes. In addition, I will also introduce another area of work when we exploit the contrast sensitivity of the human visual system and investigate the feasibility of using banding as a unique signature for EP printers. Specifically, I will discuss the concept of intrinsic and extrinsic signatures for printers and the preliminary success we have in controlling the EP process to embed visually unperceivable signatures in text and halftoned EP images.

About the Speaker. George T.-C. Chiu is an Associate Professor in the School of Mechanical Engineering at the Purdue University. He received his BS degree from the National Taiwan University in 1985 and his MS and PhD degrees in mechanical engineering from the University of California at Berkeley in 1990 and 1994, respectively. Before joining Purdue in 1996, he worked for the Hewlett-Packard Company. The sensing system he initiated at HP has been in all HP inkjet products since 1998. Dr. Chiu has published over 60 refereed journal and conference papers and was awarded 3 US patents. He is currently an associate editor for the ASME Journal of Dynamic System, Measurement and Control as well as serving on the editorial board of the Journal of Microsystem Technologies. In 1998, Dr. Chiu help founded the Purdue FIRST Robotic Programs that encourages and inspires K-12 students' interests in science and technology through a series of regional and national robotic competitions. His current research interests are mechatronics, adaptive and optimal control, perception engineering, and sensor fusion. He is currently working on modeling and control of digital imaging systems, human visual and vibration perception to engineering systems, and scanning probe microscopy.