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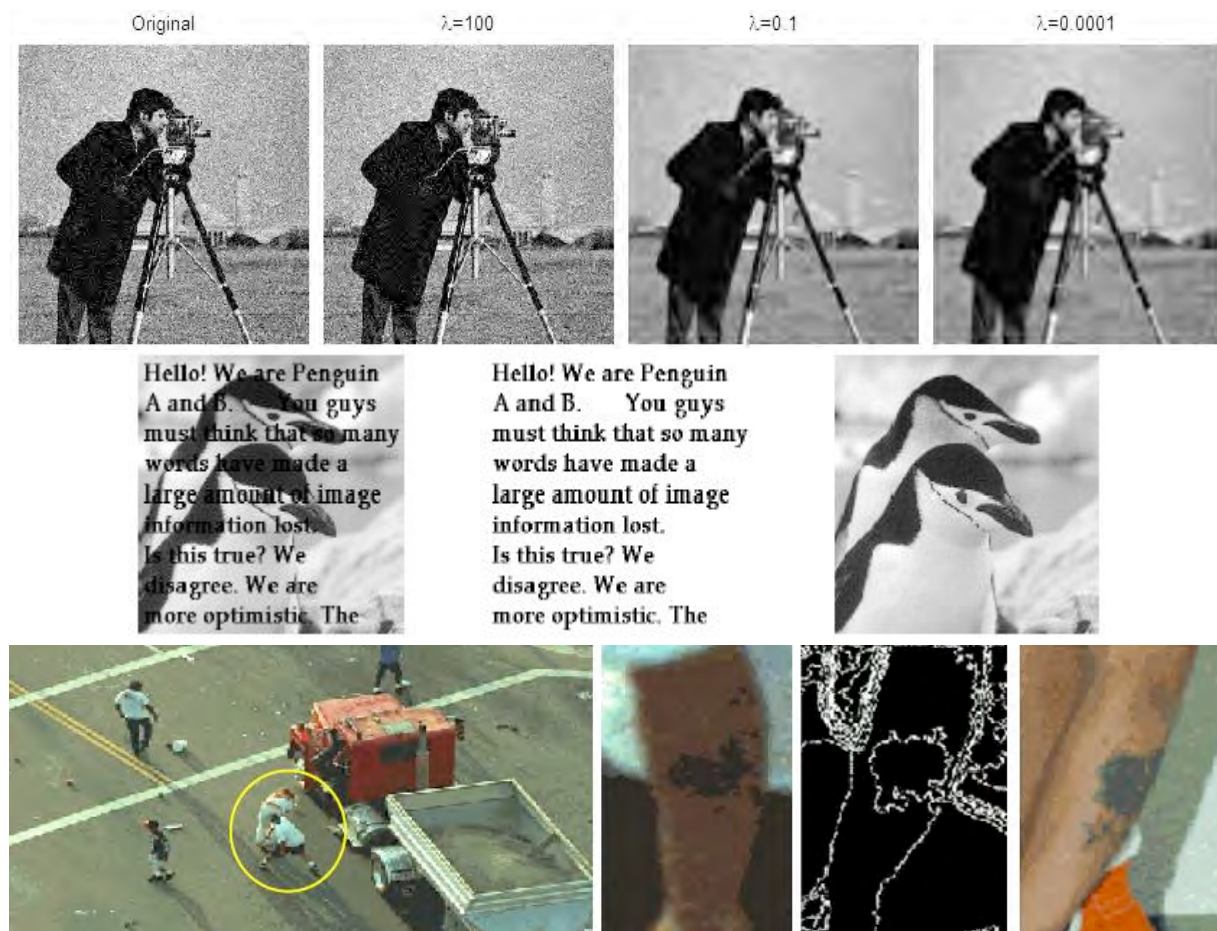
College of Science

Chester F. Carlson

Center for **IMAGING** SCIENCE

Seminar Series

Capturing the Energy of a Picture: An Introduction to Variational Models in Image Processing



Todd Wittman

Postdoctoral Researcher, Mathematics Dept., UCLA

4pm, Wed., April 30, 2008

Auditorium of the Center for Imaging Science

www.cis.rit.edu/seminar

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Abstract

Variational models, also called PDE or energy-based methods, are powerful tools for approaching a broad range of low-level image processing problems. The basic idea behind the method is to describe "good" images with a simple energy, usually measuring the amount of variation in the pixel values. Then "bad" images are made better by minimizing the energy of the image, often producing astonishing results. This talk is designed as an introduction to the mathematics and motivation behind variational models. I will start with illustrating the variational approach on a simple energy model. I will then discuss the motivation behind the famous Rudin-Osher-Fatemi Total Variation (TV) energy, which has generated hundreds of research papers and even been used to solve crimes. Time permitting, I will present applications and alternative energies.

Speaker Bio

Todd Wittman is a postdoctoral researcher in the mathematics department at University of California, Los Angeles. He received the PhD in applied mathematics in 2007 from University of Minnesota. His research focuses on the application of differential equations and the calculus of variations to problems in image processing.