

# 6.881 Computational Imaging

Spring 2006

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Prereq: 6.801, 6.866 or permission of instructor

3-0-9 H-LEVEL Grad Credit

Advanced topics on image formation by computational means.

In many fields, compute-intensive reconstruction methods produce images from raw data that may be considered to be in a coded form. Often the image construction involves inversion of an operation that is simple in the forward direction. Since computing is becoming cheaper and faster, replacing optics, or electromagnetic apparatus, or electronics with computing can be a driving force in some such image forming applications.

A basic understanding of machine vision and/or image processing will be assumed. Familiarity with concepts of linear systems, convolution, and Fourier transforms will be handy.

There will be two lectures a week, and I hope to encourage discussion and student participation. There will be some papers to read, although in some of the areas to be covered there isn't that much written yet. There will be some homework problems and a term paper/project.

Sample topics to be covered include:

- Synthetic Aperture Microscopy
- Diaphanography or "Diffuse Optical Tomography"
- Coded Aperture Imaging
- Exact Cone Beam Reconstruction

May cover other topics according to student interest.

For additional details see <http://csail.mit.edu/~bkph/courses> (click on "Computational Imaging" and then "Course Details")