INTERACTIONS BETWEEN DATA ANALYSIS OF NATURAL IMAGES, BIOLOGICAL VISION, AND MATHEMATICAL ANALYSIS

ABSTRACT

In my talk, I will try to interest the audience in links between ongoing work in three fields:

1. understanding the statistical properties of natural images—motivated by the hope of a theoretical understanding of how human vision develops,

2. understanding the arrangement of receptive fields in the visual cortex—for example, Amiram Grinvald’s work with intrinsic optical imaging, and

3. work in mathematical analysis, to develop new image transforms such as wavelets and beyond—motivated by the hope of finding radically more efficient ways to compress image data.

I sense some fascinating parallels, and I would be interested in seeing whether the audience agrees.

Professor Donoho will give another lecture on Friday, April 27 at 10:00 a.m. (preceded by refreshments at 9:30) in 104 Maryland Hall. The title of his second lecture is “Beyond Wavelets: Ridgelets, Curvelets, Beamlets.”