Other

Deblurring Images: Matrices, Spectra, and Filtering

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Abstract:
When we use a camera, we want the recorded image to be a faithful representation of the scene that we see, but every image is more or less blurry. In image deblurring, the goal is to recover the original, sharp image by using a mathematical model of the blurring process. The key issue is that some information on the lost details is indeed present in the blurred image, but this "hidden" information can be recovered only if we know the details of the blurring process. In this talk we describe the deblurring algorithms and techniques collectively known as spectral filtering methods, in which the singular value decomposition (or a similar decomposition with spectral properties) is used to introduce the necessary regularization or filtering in the reconstructed image.

Speaker's Bio:
James Nagy received a BS degree in 1986 and an MS degree in 1988 from Northern Illinois University, and a PhD in 1991 from North Carolina State University. He was a Postdoctoral Research Associate at the Institute for Mathematics and Its Applications, University of Minnesota from 1991--1992, and a member of the faculty in the Department of Mathematics at Southern Methodist University from 1992--1999. Since 1999 he has been at Emory University, where he is a professor in the Department of Mathematics and Computer Science. His research interests include numerical linear algebra (especially large scale structured linear systems), inverse problems, and image processing.

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