



ELECTRICAL & COMPUTER ENGINEERING SEMINAR

“Restoration of Soft X-Ray Laser Images of Nanostructures”

by

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Location CBS 130

Abstract: Several advanced techniques for restoration of images obtained with the 46.9 nm soft x-ray (SXR) laser microscope will be presented. We developed two advanced denoising methods, one based on wavelet transform and the other on adaptive zero order modeling of the observed object. Due to the non-uniform distribution of noise, all methods use spatial noise modeling. The wavelet method is based on adaptive thresholding, while the other uses local Wiener filtering in the wavelet domain to achieve very high noise gains. The best results were obtained by adaptive noise modeling. To our knowledge, the results over perform state-of-the art competitive methods. Furthermore, the analysis is robust to enable image acquisition with significantly lower exposure times, which is critical in samples that are sensitive to radiation damage as is the case of biological samples imaged by SXR microscopy.

Biography: Damir Seršić, Ph.D. is an associate professor at the Department of Electronic Systems and Information Processing, University of Zagreb, Faculty of Electrical Engineering and Computing. In 1999, he received his Ph.D. in Electrical Engineering from the University of Zagreb. His research interests are in the field of digital signal processing, image processing, adaptive wavelets and filter banks, blind separation and deconvolution. Several applications of his research are in the area of adaptive control and bioinformatics. He is an active researcher or principal investigator for several projects financed by the EU and Croatian funding agencies.

Among other courses, he teaches Signals and Systems and Advanced Digital Signal Processing Methods.

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