

BDR SEMINAR in Osaka

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Monday, October 21, 2019 13:00-14:30

1F Lounge, Quantitative Biology Bldg. A, Osaka

State of the art in biomedical image denoising

Andrey Krylov

Convolutional neural networks (CNN) show very good performance and achieve impressive results in biomedical image denoising. Nevertheless CNN-based methods strongly depend on the used training set and even small differences in the input data can cause output disturbance. Thus new more reliable hybrid denoising methods were suggested. They include combinations of CNN and "classical" algorithms like Non-Local Means, BM3D, Bilateral, Anisotropic diffusion, Total Variation (TV), etc. However hybrid methods need non-reference automatic parameters estimation for classical algorithms. In this paper we present a hybrid DnCNN+BM3D method with automatic choice of the strength parameter for BM3D method. To control biomedical image structures by multiscale ridge based approach we analyze presence of regular structures in the ridge areas at the difference between noisy and filtered images. Test results for different image datasets show practical applicability of the method. Some possible applications of the hybrid methods for blinking fluorescence imaging enhancement will be presented.

Super-resolution methods for blinking fluorescence imaging

Yakov Pchelintsev

A probabilistic approach for super-resolution of blinking fluorescence microscopy will be presented. Its performance will be compared with modern blinking fluorescence image enhancement algorithms, namely SOFI, MUSICAL and SPARCOM in different conditions. The comparison will be performed using both synthetic and real experimental data. The possible future work on blinking fluorescence imaging enhancement will be discussed.

This seminar is co-sponsored by:

DECODE Project, RIKEN BDR

Universal Biology Institute, The University of Tokyo

Grant-in-Aid for Scientific Research on Innovative Areas "Information physics of living matters"



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