

Patrick Ferrand

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Objet: RAPPEL - Séminaire "Optique et Applications" | Lun 25 Juin | Michael Unser | Splines: A Unifying Framework for Image Processing

RAPPEL : SEMINAIRE AUJOURD'HUI

ANNONCE DE SEMINAIRE "OPTIQUE ET APPLICATIONS"

ATTENTION ! JOUR INHABITUEL

Lundi 25 Juin, amphi Rouard, bâtiment Fresnel, DU St Jérôme, accueil et discussion dès 13:30 autour d'un café, puis à 14:00:

"Splines: A Unifying Framework for Image Processing"

par Michael UNSER
Biomedical Imaging Group
Ecole Polytechnique Fédérale de Lausanne

Abstract :

Our purpose is to justify the use splines in imaging applications, emphasizing their ease of use, as well as their fundamental properties. In particular, we will describe efficient digital filtering algorithms for the interpolation and spline-based processing of images. We will show that splines are intimately linked to differentials and identify B-splines as the exact mathematical translators between the discrete and continuous versions of the (scale-invariant) operator. This partly explains why these functions play such a fundamental role in wavelet theory. Splines may also be justified on variational and/or statistical grounds; e.g., they provide Wiener (i.e, MMSE) estimators for fractal processes such as fractional Brownian motion. We will illustrate spline processing with applications in biomedical imaging where its impact has been the greatest so far. Specific tasks include high-quality interpolation, image reconstruction (including Fresnelets), snakes, and various types of image registration.

Biography :

Michael Unser is Professor and Director of EPFL's Biomedical Imaging Group, Lausanne, Switzerland. His main research area is biomedical image processing. He has a strong interest in sampling theories, multiresolution algorithms, wavelets, and the use of splines for image processing. He has published over 150 journal papers on those topics, and is one of ISI's Highly Cited authors in Engineering (<http://isihighlycited.com>). From 1985 to 1997, he was with the Biomedical Engineering and Instrumentation Program, National Institutes of Health, Bethesda USA, conducting research on bioimaging and heading the Image Processing Group. Dr. Unser is a fellow of the IEEE and the recipient of three Best Paper Awards from the IEEE Signal Processing Society.

Venez nombreux !

Patrick Ferrand (Institut Fresnel)
Caroline Champenois (PIIM)
<http://www.fresnel.fr/animation-scientifique/index.php>