

Denoising Methods for Bioimaging: Advances in Theory and Implementations - DMB 2018

Date : Jan 19, 2018 - 08:00 AM

Event URL : <http://www.sfbayeventslist.com/events/denoising-methods-for-bioimaging-advances-in-theory-and-implementations-dmb>

Organizer : NYMT

Venue :

Location : Hotel Vila Galã© Santa CruzRua So Fernando, 59100-173 Santa CruzPortugal, Santa Cruz, Portugal, US, ZIP: 59100-173

Denoising Methods for Bioimaging: Advances in Theory and Implementations - DMB 2018

19 - 21 January, 2018 - Funchal, Madeira, Portugal

Within the 5th International Conference on Bioimaging - BIOIMAGING 2018

CHAIR

Jan Schier

The Institute of Information Theory and Automation of the Czech Academy of Sciences
Czech Republic

Brief Bio

Jan Schier obtained his MSc degree in electrical engineering in 1989 and Ph.D. in 1995 mathematical engineering, both from Czech Technical University. Since the beginning of his Ph.D. studies, he has been with the Institute of Information Theory and Automation, Academy of Sciences of the Czech Republic, Prague. He has started his research career in the field of parallel implementations of the signal processing algorithms.

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Between 1995-2002 he has been on several long-term stays with the Faculty of Electrical Engineering at TU Delft, the Netherlands and with the SISTA group of the Department of Electrical Engineering, KU Leuven, Belgium, in both cases working in the field of applied signal processing.

An informal cooperation with the Yeast Colony Group at the Faculty of Sciences, Charles University, which started round 2009, started his interest in image processing for microscopy and bioimaging, which eventually led him to join the Image Processing group of UTIA in October 2011. The paper on Colony Counting Tool has been awarded the Best Paper Award at the BIOSTEC/BIOINFORMATICS conference in 2011. His current interests cover mainly image denoising and segmentation methods for bioimaging and microscopy imaging, as well as - on the practical side - Java programming for ImageJ. He is mainly involved in projects of applied research and implementation projects: recent examples include evaluation of Langerhans Islets (in close cooperation with Czech Technical University and Institute for Clinical and Experimental Medicine) and evaluation of breast ultrasound examinations (Technology Agency of the Czech Republic project TA04011392 "Early ultrasound detection of breast cancer").

Dr. Schier has served as the program co-chair for the BIOSTEC/BIOIMAGING conference in 2014 and 2015.

SCOPE

Denoising plays crucial role probably in all modalities of bioimaging: it is widely used in medical imaging modalities such as MRI, X-Ray, ultrasound, but in the same time, it is indispensable for advanced techniques of microscopy imaging. Compared with standard imaging conditions as encountered in technical applications, the bioimaging field comes with some unique challenges: often, we have to cope with non-Gaussian character of image noise. In order to preserve information on anatomical structures or cells contained in the image, preservation of object edges is of high importance.

In the past years, number of advanced methods have emerged, often well suited to cope with these requirements, such as the multiscale and wavelet methods and their novel modifications or various versions of non-local means methods to name but two major directions of algorithmic development.

However, the improved performance often comes at computational costs and various approximative schemes or specialized parallel hardware have to be utilized in order to achieve acceptable computational performance. There are still many challenging tasks both in improving denoising performance and in getting proper balance between denoising performance and acceptable execution speed.

With this Special Session, we would like to bring together both experts specialized rather in algorithmic development and those more interested in the implementation part of the story, also in embedded systems. We would like to contribute to discussion between both groups, since the complex view of algorithms in the context of underlying hardware is necessary.

TOPICS

The topics of this Special Session includes, but is not limited to:

- advanced algorithms for bioimage denoising
- algorithms for reducing non-Gaussian or mixed noise
- algorithms for multidimensional images
- practical implementations, plugins for ImageJ, Fiji, Icy,...
- advanced denoising methods for microscopy
- fast implementations using GPU or special computational architectures
- new approaches to image denoising and restoration: deep learning and others

Important Dates

Conference

Regular Papers

Paper Submission: September 5, 2017 (extended)

Authors Notification: October 16, 2017

Camera Ready and Registration: October 30, 2017

Position Papers

Paper Submission: September 29, 2017

Authors Notification: November 7, 2017

Camera Ready and Registration: November 20, 2017

Workshops

Workshop Proposal: August 31, 2017

Doctoral Consortium

Paper Submission: November 9, 2017

Authors Notification: November 22, 2017

Camera Ready and Registration: December 5, 2017

Special Sessions

Special Session Proposal: August 31, 2017

Paper Submission: November 7, 2017

Authors Notification: November 21, 2017

Camera Ready and Registration: November 29, 2017

Tutorials

Tutorial Proposal: November 24, 2017

Demos

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Demo Proposal: November 24, 2017

Panels

Panel Proposal: November 24, 2017

Keynote Lectures

Available Soon

Anatole Lécuyer, Inria Rennes/IRISA, Hybrid Research Team, France

Available Soon

Corina Sas, Lancaster University, United Kingdom

Available Soon

Dinesh Kumar, RMIT University, Australia

Available Soon

Maximiliano Romero, Università luav di Venezia, Italy

Keynote Lecture

□ **Anatole Lécuyer**

Inria Rennes/IRISA, Hybrid Research Team

France

Brief Bio

Anatole Lécuyer is senior researcher and head of Hybrid team at Inria (Rennes, France), the French National Institute for Research in Computer Science and Control, that he joined in 2002. His main research interests are in the field of Virtual Reality, and more specifically on 3D User Interfaces, Haptic Feedback, 3D Visual Displays, and Brain-Computer Interfaces (BCI). He has been involved often as coordinator or principal investigator in various National or International research projects such as in OpenViBE software for Brain-Computer Interfaces, French ANR projects “OpenViBE1” (05-09) and “OpenViBE2” (09-12) on Brain-Computer Interfaces and Virtual reality, European Strep project “NIW” (08-11) on Augmented Walking, and the European Network of Excellence “INTUITION” (05-08) on Virtual Reality. He regularly serves as expert in Virtual Reality and BCI for public bodies such as European Commission (EC) or French National Research Agency (ANR). He is involved in program committees of major conferences of his field (IEEE VR, IEEE 3DUI, Eurohaptics, Eurographics, etc) and was notably program co-chair of www.sfbayeventslist.com

IEEE VR 2015, and IEEE 3DUI 2013. He is an associate editor of Frontiers in Virtual Environments and Presence, and formerly of ACM Transactions on Applied Perception (ACM TAP) and International Journal of Human-Computer Studies (IJHCS).

Keynote Lecture

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Corina Sas
Lancaster University
United Kingdom

Brief Bio

Dr Sas builds on extensive expertise in Human Computer Interaction and user experience to design technologies for wellbeing and health, including those for self-monitoring, self-awareness and self-regulation. She has been Associate Chair for the top ACM Computer Human Interaction and Designing Interactive Systems conferences, Chair of British Human Computer Interaction conference, and served in Programme Committees in over 20 conferences. Her work has received extensive media covers including The Times, The New Scientist, Daily Mail, CBS, NBC, Medical Daily, Science Daily, News medical, and Health Medicine Network, as well as San Francisco radio, BBC 5 live radio, and BBC Hereford and Worcester radio. For her work on technologies for mindfulness she was mentioned in the TransTech200 (2016): an annual list of key innovators developing science-based research that significantly increases mental and emotional wellbeing. She has over 80 peer-reviewed publications, and has been an investigator on grants totalling over £10.5 million.

Keynote Lecture

□
Dinesh Kumar
RMIT University
Australia

Brief Bio

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Dinesh research interests are related to medical applications of signals and image processing and the use of machine learning to classify medical signals. He is a member of the expert panel for prosthetic hand control (EU supported committee) and member on Therapeutic Goods Administration the advisory panel to ministry of health for medical devices. Dinesh has also extensive experience in technology translation and been successful with two technology start-up ventures.

Dinesh has received over \$4 million in research funds over the past 12 years in research funding. He has published over 400 papers and authored 3 books, and has been cited about 4400 times. He is Associate editor for IEEE Transactions for neural systems and rehabilitation engineering.

Abstract

There has been significant progress in medical technology that provides early stage and detailed diagnosis of many diseases. This has enhanced the longevity and quality of life and we are now living longer and healthier, and significantly more independent. We are also able to perform relevant functional activities for significant period. However, many of these diagnostics can be performed only in major hospitals and require significant infrastructure such as qualified personnel, buildings, and electricity. This greatly limits the benefits of the technologies to be located in large urban centres.

Dinesh has been working towards changing the above paradigm and works for the development of diagnostic devices that are suitable for being used in remote regions by untrained healthcare personnel. Such devices provide automation of recording and analysis of the data, thereby do not require large buildings, and are suitable for the target audience. The success of such diagnostic devices is based on the development of advanced image and signal processing techniques that makes these devices noise tolerant and provide good quality diagnostics without high quality infrastructure.

Keynote Lecture

□ **Maximiliano Romero**
Università luav di Venezia
Italy

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