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Today's Editor: Patricia (Patti) K. Lamm, Michigan State University

Today's Topics:
Workshops: Mathematical Imaging Workshops at Isaac Newton Institute
Postdoctoral Positions: PET/SPECT, Image Reconstruction, Deep Dictionary Learning
PhD Studentships: Inverse Problems in Ultrasound Computed Tomography
Asst./Assoc. Professorship: Big Data, Computational Inverse Problem Methods
Call for Papers: Special issue on Inverse Wave Propagation Problems (Inverse Problems)
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Submissions for IPNet Digest:
Mail to ipnet-digest@math.msu.edu

Information about IPNet:
http://ipnet.math.msu.edu

From: Isaac Newton Institute <communications@newton.ac.uk>
Subject: Mathematical imaging workshops: final call for attendees, October - December 2017
Date: August 16, 2017

Final call:
"Variational methods and effective algorithms for imaging and vision" workshops
October - December 2017

Variational methods and effective algorithms for imaging and vision

The Isaac Newton Institute would like to announce a final call for participants in the three remaining workshops of the "Variational methods and effective algorithms for imaging and vision" programme, which will take place in Cambridge and Warwick between October and December 2017.

In recent history, mathematical imaging, image processing and computer vision have become fundamental for gaining information on various aspects in medicine, the sciences, and technology, in the public and private sector equally. The rapid development of new imaging hardware, the advance in medical imaging, the advent of multi-sensor data fusion and multimodal imaging, as well as the advances in computer vision have sparked numerous research endeavours leading to highly sophisticated and rigorous mathematical models and theories.

These international and inter-disciplinary gatherings will foster exchange between different groups of researchers and practitioners who are involved in mathematical imaging science, and stimulate discussions on new horizons in theory, numerical methods and applications of mathematical imaging and vision.

The full details of each workshop are as follows:

VMVW02: "Generative models, parameter learning and sparsity" will take place from 30 October - 3 November 2017 at the Isaac Newton Institute in Cambridge. This week-long workshop will focus on key issues in image reconstruction, and will discuss image priors, data models and the qualities of a variational imaging approach.

To register by 3 September 2017: http://www.newton.ac.uk/event/vmvw02
http://www.newton.ac.uk/event/vmvw02

VMVW03: "Flows, mappings and shapes" will take place from 11-15 December 2017 at the Isaac Newton Institute in Cambridge. This workshop will bring together the leading experts in image processing, computer vision and shape analysis to discuss the directions that have the potential to lead to the next big breakthroughs and their implications for other allied disciplines.

To register by 30 September 2017: http://www.newton.ac.uk/event/vmvw03

VMVW04: "Image analysis and processing in the life sciences" will take place from 2-3 October 2017 at the University of Warwick. The workshop's objective is to facilitate the interaction and discussion between researchers from the life sciences working with or on imaging technology, and mathematicians developing and methodology in image analysis and processing.

To register via the University of Warwick's
website: http://www.newton.ac.uk/event/vmvw04

Submitted by:
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From: Ozan Öktem <ozan@kth.se>
Subject: Post-doc announcements
Date: August 9, 2017

Postdoctor in PET/SPECT Image Reconstruction (S-2017-1166)
Deadline: December 1, 2017
Brief description:
The position includes research & development of algorithms for PET and SPECT image reconstruction. Work is closely related to on-going research on (a) multi-channel regularization for PET/CT and SPECT/CT imaging, (b) joint reconstruction and image matching for spatio-temporal pulmonary PET/CT and cardiac SPECT/CT imaging, and (c) task-based reconstruction by iterative deep neural networks. An important part is to integrate routines for forward and backprojection from reconstruction packages like STIR and EMrecon for PET and NiftyRec for SPECT with ODL

(http://github.com/odlgroup/odl), our Python based framework for reconstruction. Part of the research may include industrial (Elekta and Philips Healthcare) and clinical (Karolinska University Hospital) collaboration.
Announcement & instructions:
http://www.kth.se/en/om/work-at-kth/lediga-jobb/what:job/jobID:158920/type:job/where:4/apply:1

Postdoctor in Image Reconstruction/Deep Dictionary Learning (S-2017-1165)
Deadline: December 1, 2017
Brief description:
The position includes research & development of theory and algorithms that combine methods from machine learning with sparse signal processing for joint dictionary design and image reconstruction in tomography. A key element is to design dictionaries that not only yield sparse representation, but also contain discriminative information. Methods will be implemented in ODL (http://github.com/odlgroup/odl), our Python based framework for reconstruction which enables one to utilize the existing integration between ODL and TensorFlow. The research is part of a larger effort that aims to combine elements of variational regularization with machine learning for solving large scale inverse problems, see the arXiv-reports http://arxiv.org/abs/1707.06474 and http://arxiv.org/abs/1704.04058 and the blog-post at http://adler-j.github.io/2017/07/21/Learning-to-reconstruct.html for further details. Part of the research may include industrial (Elekta and Philips Healthcare) and clinical (Karolinska University Hospital) collaboration.
Announcement & instructions:
http://www.kth.se/en/om/work-at-kth/lediga-jobb/what:job/jobID:158923/type:job/where:4/apply:1

Submitted by:
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From: Simon ARRIDGE <S.Arridge@cs.ucl.ac.uk>
Subject: PhD Positions, UCL, Inverse Problems in Ultrasound Computed Tomography
Date: August 26, 2017

Applications are invited from highly motivated candidates for two PhD studentships in the area of "Inverse Problems in Ultrasound Computed Tomography of the Breast"

The studentships will be based in the Department of Computer Science and the Department of Medical Physics & Biomedical Engineering at University College London, and will be undertaken in collaboration with the National Physical Laboratory.

See https://goo.gl/MPr7WJ for further details.

Funding will be for 3 years, with a tax free stipend of £16,553 per year plus UK/EU-level university fees. Outstanding students from outside the EU may apply if they have funding to support international fees. The closing date is 15th September 2017 and the anticipated start date is October 2017.

Applicants must be UK students or EU students who will have spent the previous 3 years in the UK.

If you have any scientific queries please contact Professor Simon Arridge (Computer Science) s.arridge@ucl.ac.uk or Dr Ben Cox (Medical Physics) b.cox@ucl.ac.uk.

From: Ville Kolehmainen <ville.kolehmainen@uef.fi>
Subject: open position
Date: August 29, 2017

Assistant or Associate Professor (Tenure Track position) in Big Data and Modelling of Uncertainties in Environmental Change, University of Eastern Finland, Department of Applied Physics, Kuopio, Finland

The University of Eastern Finland, UEF, is one of the largest multidisciplinary universities in Finland. We offer education in nearly one hundred major subjects, and are home to approximately 15,000 students and 2,500 members of staff. We operate on three campuses in Joensuu, Kuopio and Savonlinna. In international rankings, we are ranked among the leading universities in the world.

The Faculty of Science and Forestry operates on the Kuopio and Joensuu campuses of the University of Eastern Finland. The mission of the faculty is to carry out internationally recognised scientific research and to offer research-education in the fields of natural sciences and forest sciences. The faculty invests in all of the strategic research areas of the university. The faculty’s environments for research and learning are international, modern and multidisciplinary. The faculty has approximately 3,800 Bachelor’s and Master’s degree students and some 490 postgraduate students. The number of staff amounts to 560. http://www.uef.fi/en/lumet/etusivu

We are now inviting applications for

an Assistant or Associate Professor (Tenure Track position) in Big Data and Modelling of Uncertainties in Environmental Change, Department of Applied Physics, Kuopio Campus

The position is research-oriented, and the specific duties associated with the position are research and teaching addressing advanced data analysis and computational inverse problems methods in uncertainty quantification of sustainability of natural resources, in particular, related to atmospheric and ecosystem processes. A successful candidate should have a strong background in applying computational methods to physical phenomena. In addition, knowledge on transport phenomena and/or atmospheric aerosol processes is an advantage. The research is implemented in the Computational Physics and Inverse Problems group (http://venda.uef.fi/inverse/) in close collaboration with the Aerosol Physics group (https://www.uef.fi/fi/web/aerosol).

The currently open position will strengthen the activities of the university's strategic research areas. Please
see: http://www.uef.fi/en/tutkimus/strategiset-tutkimusalueet-2015-2020

The person can enter the Tenure Track position from the Assistant or Associate Professor level, depending on the qualifications of the appointee. At the end of the term, the merits of the person will be evaluated to determine whether he or she can proceed to the next level in the Tenure Track without public notice of vacancy. The criteria, objectives and results to be achieved during the term in order to proceed to the next level of the Tenure Track will be agreed with the appointee in detail when signing the contract of employment. An Associate Professor can be invited to a professorship on the basis of expert statements.

A person to be appointed as an associate professor or an assistant professor in the tenure track shall hold a suitable doctoral degree and have good teaching skills. Furthermore, a person to be appointed as an associate professor in the tenure track shall have the prerequisites for fulfilling the qualification requirements of a professor by the end of the tenure track term (UEF University Regulations 31 §).

Scientific achievements in the field of the position (to be demonstrated through publications) and previous experience in university-level teaching, supervision of Bachelor's, Master's and doctoral students, responsible tasks in research projects, acquisition of research funding and engagement in international cooperation will be regarded as merits. A successful applicant will also have good cooperation skills.

English may be used as the language of instruction and supervision in this position.

The position will be filled for a fixed term of 4 years from 1 January 2018 or as agreed. The position is filled for a fixed term due to it being a fixed-term research and teaching position (Tenure Track).

The salary of the position is determined in accordance with the salary system of Finnish universities and is based on level 6-7 of the job requirement level chart for teaching and research staff (€ 3,340.77 – 3,851.33/month). In addition to the job requirement component, the salary includes a personal performance component, which may be a maximum of 46.3% of the job requirement component.

For further information on the position, please contact Head of the Department, Professor Kari Lehtinen, tel.+358 40 867 7844 , email: kari.lehtinen@uef.fi For further information on the application procedure, please contact Executive Head of Administration Arja Hirvonen, tel. +358 44 716 3422, email: arja.hirvonen@uef.fi.

A probationary period is applied to all new members of the staff.

The electronic application is required to contain the following appendices:
- a résumé or CV

- a portfolio of teaching merits

- a list of publications

- a research proposal not exceeding five pages in length

- copies of the applicant's academic degree certificates/ diplomas, and copies of certificates / diplomas relating to the applicant’s language proficiency, if not indicated in the academic degree certificates/diplomas

The application needs to be submitted no later than 22 September 2017 (by 24.00 hours Finnish time) by using the electronic application form.

Link for the application: Apply for the job (the electronic application form can be found also
from the description of the open position
at http://www.uef.fi/en/uef/en-open-positions)

Submitted by:
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From: Daniel Jopling <Daniel.Jopling@iop.org>
Subject: Call for papers, Inverse Problems special issue on Inverse wave propagation problems without phase information
Date: August 2, 2017

Call for papers, Inverse Problems special issue on

Inverse wave propagation problems without phase information

http://iopscience.iop.org/journal/0266-5611/page/Special_issue_on_Inverse_wave_propagation_problems_without_phase_information

Guest editors

- Thorsten Hohage University of Gottingen, Germany
- Roman Novikov Ecole Polytechnique, Paris-Saclay, France

Aims

This special issue will capture recent developments in the classical phase problem in quantum mechanics, optics, and related areas. By Born's rule, the square of the amplitude of a particle's wave function is proportional to the probability of finding the particle at a given point, whereas the wave function itself has no direct physical interpretation. Similarly, most optical measurement techniques only provide information on the amplitude, but not on the phase of time-harmonic electromagnetic waves. While classical inverse scattering theory has focused mostly on data with phase information, new exciting results on phaseless data have appeared recently on the theoretical, algorithmic, and experimental side. This special issue will present papers on new developments in these different aspects of phaseless inverse problems and will thus provide an overview on the state-of-the-art of this active field of research.

Scope

Relevant topics that would be considered for inclusion in this special issue include:

- Inverse scattering without phase information
- Coherent x-ray imaging
- Phaseless imaging in random media
- Uniqueness, non-uniqueness, and stability results
- Explicit (approximate) reconstruction formulas
- Reconstruction algorithms and their convergence analysis
- Novel applications and reconstructions from experimental data

Submission deadline: 31 March 2018.

Note to authors: the guest editors have agreed for individual articles to be published incrementally (i.e. as soon as they are accepted), rather than as a batch. This ensures that authors get published more quickly. All papers will also be collected into a virtual special issue accessible via the journal homepage.

From: <noreply@iopscience.org>
Subject: Inverse Problems, Volume 33, Number 9, September 2017

Date: August 23, 2017

Inverse Problems September 2017 Volume 33, Number 9

Special Issue Paper

Reconstruction of a time-dependent potential from wave measurements
Thies Gerken, and Armin Lechleiter

Papers

Optimal stability estimates for a magnetic Schrödinger operator with local data
Leyter Potenciano-Machado

Joint denoising and distortion correction of atomic scale scanning transmission electron microscopy images
Benjamin Berkels, and Benedikt Wirth

Stable determination of an inclusion for a class of anisotropic conductivities
Michele Di Cristo, and Yong Ren

Convergence analysis of a two-point gradient method for nonlinear ill-posed problems
Simon Hubmer, and Ronny Ramlau

A limited memory BFGS method for a nonlinear inverse problem in digital breast tomosynthesis
G Landi, E Loli Piccolomini, and J G Nagy

Simultaneous determination of the drift and diffusion coefficients in stochastic differential equations
Michel Cristofol, and Lionel Roques

Uniqueness of a 3-D coefficient inverse scattering problem without the phase information
Michael V Klibanov, and Vladimir G Romanov

Sparse spikes super-resolution on thin grids II: the continuous basis pursuit
Vincent Duval, and Gabriel Peyré

M-matrices with prescribed elementary divisors
Ricardo L Soto, Roberto C Díaz, Mario Salas, and Oscar Rojo

Corrigendum: Inverse problems for the perturbed polyharmonic operator with coefficients in Sobolev spaces with non-positive order (2016 Inverse Problems 32 105009)
Yernat M Assylbekov 2017 Inverse Problems 33 099501
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