

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

Today's Topics:

Virtual Event: Inverse Days 2020 and 60th Birthday of Erkki Somersalo

Postdoc: AI for Inverse Problems with Applications to Imaging, UNC Charlotte

Postdoc, PhD Positions: Comp. Uncertainty Quantification for Inverse Problems, TU Denmark

PhD Positions: Modeling, Analysis, Optimization of Systems, University of Klagenfurt

Research/Postdoc Positions: Areas include Inverse Problems, Flatiron Institute, NYC

Tenure Track Position: Areas include Inverse Problems, Michigan Tech U

PhD Positions: Data Science, Image Restoration, U of Edinburgh

Special Issue: Modelling and Estimation in Digital Twins (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: "Bubba, Tatiana" <tatiana.bubba@helsinki.fi>

Date: Monday, October 19, 2020

Subject: Virtual Inverse Days, 14-18 December 2020

Dear Colleagues,

Inverse Days 2020 will be organised in the time period December 14-18, virtually this year due to the pandemic. The meeting is organised jointly by the Finnish Meteorological Institute and University of Helsinki. The 60th birthday of Professor Erkki Somersalo will be celebrated as part of the event.

The tentative schedule and the registration form (deadline: November 15, 2020) are available on the conference website: <http://www.fips.fi/id2020.php>

There is no conference fee, but we kindly ask you to register for organisation purposes.

This year, there will be fewer talk slots than usually, and therefore preference will be given for young researchers.

Looking forward to e-meeting you all at the Virtual Inverse Days!

All the best,

Tatiana Bubba

on behalf of the Scientific Committee: Janne Hakkarainen, Marko Laine, Matti Lassas, Samuli Siltanen and Johanna Tamminen

From: Taufiqar Khan <taufiqar.khan@uncc.edu>
Date: Friday, October 2, 2020
Subject: Postdoctoral fellow in artificial intelligence approaches for inverse problems with applications to imaging

<https://jobs.uncc.edu/postings/32585>

Postdoctoral fellow in artificial intelligence approaches for inverse problems with applications to imaging

Applications are invited for a postdoctoral research position at the University of North Carolina at Charlotte. The duration of this position is a one year position with a possibility of renewal up to three years, subject to a budget approval. The successful candidate will work under the supervision of Professor Taufiqar Khan. The research of this candidate will be focused on exploring computational aspects of solving an inverse problem using artificial intelligence approaches such as machine learning with applications to imaging. The candidate is also expected to have sufficient background on regularization of ill-posed inverse problems arising from coefficient inverse problems involving partial differential equations.

The position will begin in January, 2021 (pending hiring and possible visa paperwork) and the candidate will be paid \$48,000, annually. Interested candidates are welcome to send their curriculum vitas, a brief (max one page) statement of research interests and one to three papers/preprints reflecting their research experience to <https://jobs.uncc.edu> (please click "Post Doc."). In addition to submitting your application electronically, please email your materials to Professor Khan's assistant, Ms. Sarah Hornbeck (srhornbe@uncc.edu) Questions about these positions may be directed to Ms. Sarah Hornbeck.

Thanks and regards,

Taufiqar R Khan, Ph.D.
Professor and Chair
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taufiqar.khan@uncc.edu | <http://www.math.uncc.edu>

From: Per Christian Hansen <pcha@dtu.dk>
Date: Monday, October 19, 2020
Subject: PhD and Postdoc position, Computational UQ, Technical Univ. of Denmark

PhD and Postdoc position, Computational UQ, Technical Univ. of Denmark

The Technical University of Denmark opens a 2-year Postdoc position and a 3-year PhD position starting January 1, 2021 or soon thereafter. These positions are part of the project Computational Uncertainty Quantification for Inverse problems, CUQI: www.compute.dtu.dk/english/cuqi.

The postdoc will contribute to design, abstraction, and implementation of fundamental Bayesian inversion methods with focus on exploitation of problem structure, choice of sampling methods, acceleration of the forward model computations, and suitable user interfaces. The work is done in close collaboration with UQI project members. The postdoc will also help support and train users of the CUQI software, as well as develop documentation and tests.

The PhD student will pursue uniqueness results and stability estimates for inverse source problems and passive medium imaging problems involving random media. The project will quantify the uncertainty in solutions due to measurement noise or random medium noise, and due to incomplete measurement data, as well as derive and test convergence estimates for numerical solvers.

Both the Postdoc and the PhD student will work individually and as team players supported by dedicated supervisors, and contribute to a general computational platform for UQ for inverse problems. Applicants are expected to contribute to teaching and training activities as well as supervision of students.

For more details and to apply, see: tiny.cc/CUQI-Postdoc-3 and tiny.cc/CUQI-PhD-4

-Per Christian Hansen, Jakob Sauer Jørgensen and Mirza Karamehmedović

Submitted by:
Professor Per Christian Hansen
Villum Investigator
Section for Scientific Computing
DTU Compute - Technical University of Denmark
Tel +45 23.65.27.98
<http://www2.compute.dtu.dk/~pcha/>
CUQI project: <https://www.compute.dtu.dk/cuqi>

From: Elena Resmerita <elena.resmerita@aau.at>
Date: Tuesday, October 20, 2020
Subject: PhD positions in Klagenfurt

Hello,

The University of Klagenfurt is pleased to announce the following open positions:

3 PhD positions (all genders welcome)
within the doc.funds doctoral school Modeling - Analysis - Optimization of discrete, continuous, and stochastic systems.

Required qualification:
- Master's degree at a national or international university in mathematics or a related field.

This requirement must be fulfilled two weeks before the starting date at the latest; hence, the last possible deadline for meeting this requirement is July 16, 2021.

- strong background in one or more of the following or related fields: discrete

optimization, regularization methods, dynamical systems

- An interest in multi-perspective research combining different mathematical sub-disciplines

- Programming skills (e.g., Python, Matlab, R, SageMath, Maple, Mathematica, C/C++, ...)

- Fluency in English

Deadline for applications: November 11, 2020.

For details, see

<https://www.europeanwomeninmaths.org/offer/3-predoc-positions-all-genders-welcome/>

Thank you and best regards,

Elena Resmerita

From: Alex Barnett abarnett@flatironinstitute.org [via NADIGEST]

Date: October 05, 2020

Subject: Research Scientist/Postdoc Positions, CCM, Flatiron Institute, USA

We are excited to hire this year in scientific computing and computational statistics/machine learning at the Center for Computational Mathematics, Flatiron Institute, in New York City. CCM provides an attractive combination of an academic-style research environment with a lab-style long term view on tool building and software, plus strong interactions with the four other centers at the Institute (computational biology, astrophysics, quantum physics, and neuroscience) as well as local universities. We seek new research staff members at the junior level (equivalent to junior faculty), at higher levels, and also have 3-year postdoc positions.

Broad areas of interest include: numerical analysis and PDE; signal and image processing, inverse problems; computational statistics and probabilistic programming; statistical methodology, modeling, and inference; machine learning and its mathematical foundations; software development and high performance computing; science application areas including biology, medicine, chemistry, and physics.

For full details see our three ads which are posted here:

[https://urldefense.com/v3/__https://simonsfoundation.wd1.myworkdayjobs.com/ccmcareers/__;!!HXCxUKc!njggAxniTVE_T4Bz7zCf16u40JFNHX_4M4IhV4jdMay1AU1sxdIvle3HDpBQ2opN\\$](https://urldefense.com/v3/__https://simonsfoundation.wd1.myworkdayjobs.com/ccmcareers/__;!!HXCxUKc!njggAxniTVE_T4Bz7zCf16u40JFNHX_4M4IhV4jdMay1AU1sxdIvle3HDpBQ2opN$)

From: Jiguang Sun jiguangs@mtu.edu [via NADIGEST]

Date: October 07, 2020

Subject: Tenure-Track Position, Computational and Applied Math, MichiganTech

Applications are invited for a tenure-track Assistant Professor position in Computational and Applied Mathematics. All research areas in Computational and Applied Mathematics will be considered, but candidates with expertise in Computational PDEs, Randomized Numerical Linear Algebra, Model Reduction, Uncertainty Quantification,

Operations Research, and Inverse Problems are encouraged to apply.

Required qualifications for this position are a PhD in Mathematics or a related field, a strong research program, and potential for excellence in classroom teaching.

Michigan Tech, a doctoral research university with an international reputation, is located in Houghton in Michigan's scenic Upper Peninsula, on the south shore of Lake Superior. The Department of Mathematical Sciences has 35 faculty members with interests in probability, statistics, computational mathematics, combinatorics, algebra, and number theory. It offers BS, MS, and PhD degrees in both Mathematics and Statistics. The department enrolls about 120 undergraduate students and 70 graduate students, and plays a key role in the university's interdisciplinary programs in Data Science and in Computational Science and Engineering. The position starts 16 August 2021. Candidates applying by 1 November 2020 are assured full consideration, but the position remains open until it is filled. Interested candidates should submit a curriculum vita, three letters of recommendation (at least one of which addresses the candidate's teaching ability), a description of proposed research program, and a statement of teaching interests through Mathjobs.org and Michigan Technological University at [https://urldefense.com/v3/__https://www.employment.mtu.edu/en-us/listing/__;!!HXCxUKc!njggAxniTVE_T4Bz7zCfl6u40JFNHX_4M4IhV4jdMaylAU1sxdIvle3HDj9Gslzi\\$](https://urldefense.com/v3/__https://www.employment.mtu.edu/en-us/listing/__;!!HXCxUKc!njggAxniTVE_T4Bz7zCfl6u40JFNHX_4M4IhV4jdMaylAU1sxdIvle3HDj9Gslzi$) .

From: Nick Polydorides n.polydorides@ed.ac.uk [via NADIGEST]
Date: October 24, 2020
Subject: PhD Positions, Data Science, Univ of Edinburgh

The Real-time Simulation & Computational Imaging Group at the School of Engineering invites applications for PhD positions on randomised numerical algebra for

- (i) 'Real-time image restoration', and
- (ii) 'Sketching for data-intensive health analytics'

The aim of these posts is to pursue research in the exciting new field of randomised numerical algebra in order to expedite algorithms for image restoration and online model learning.

Candidates should have an above-average master's/diploma degree in mathematics, statistics or computer science with a focus on inverse problems, Monte Carlo methods and linear algebra.

Further and eligibility please visit

[https://urldefense.com/v3/__http://www.homepages.ed.ac.uk/npolydor/PhD1_2021.pdf__;!!HXCxUKc!h-A1GAN4XkYyXzfvspEGDQPMGbX4t9pecYcX051581fSTtTxTEsDvQZmOFjyt2m\\$](https://urldefense.com/v3/__http://www.homepages.ed.ac.uk/npolydor/PhD1_2021.pdf__;!!HXCxUKc!h-A1GAN4XkYyXzfvspEGDQPMGbX4t9pecYcX051581fSTtTxTEsDvQZmOFjyt2m$)
[https://urldefense.com/v3/__http://www.homepages.ed.ac.uk/npolydor/PhD2_2021.pdf__;!!HXCxUKc!h-A1GAN4XkYyXzfvspEGDQPMGbX4t9pecYcX051581fSTtTxTEsDvQZmM5Dea0Y\\$](https://urldefense.com/v3/__http://www.homepages.ed.ac.uk/npolydor/PhD2_2021.pdf__;!!HXCxUKc!h-A1GAN4XkYyXzfvspEGDQPMGbX4t9pecYcX051581fSTtTxTEsDvQZmM5Dea0Y$)

More info on our group's activities and projects

[https://urldefense.com/v3/__http://www.homepages.ed.ac.uk/npolydor__;!HXcXUKc!h-A1GAn4XkYyXzfvspEGDQPMGbX4t9pecYcX051581fSTtTxTEsDvQZmCFvTDEf\\$](https://urldefense.com/v3/__http://www.homepages.ed.ac.uk/npolydor__;!HXcXUKc!h-A1GAn4XkYyXzfvspEGDQPMGbX4t9pecYcX051581fSTtTxTEsDvQZmCFvTDEf$)

Informal enquiries: n.polydorides@ed.ac.uk

Deadline: 15th of January 2021.

From: Nick Polydorides n.polydorides@ed.ac.uk [via NADIGEST]
Date: October 09, 2020
Subject: Special Issue, Modelling and Estimation in Digital Twins

Digital twinning is the coupling between a dynamic system (physical asset) and its computerised model (digital asset). The scope of this is to allow for prediction and optimisation of operations via the digital asset over the lifetime of the physical one. This, in turn, requires that the computerised model is promptly calibrated so that its response matches as close as possible the behaviour of the physical asset via a continuous cycle of sensor data assimilation and model prediction, tracking the temporal evolution of the physical system. This framework is rooted in inverse problems and mathematical modelling under uncertainty, and finds applications in automation of manufacturing processes, structural health monitoring and biomedical signal and image processing, among other areas. Of particular importance to the digital twins context is the computational efficiency of the algorithms involved and their scalability in increasing dimensions, as model estimation and prediction tasks must be available in near real-time to allow for timely decisions and controls. This Special Issue aims to bring together articles discussing recent algorithmic advances in mathematical modelling and inverse problems of high-dimensional and complex systems. Articles on topics in real-time simulation, model order reduction, online learning, scalable uncertainty quantification and data-driven models are particularly welcome.

Link:

https://www.mdpi.com/journal/mathematics/special_issues/modelling_and_estimation_in_digital_twins

From: "alerts@tandfonline.com" <alerts@tandfonline.com>
Date: Tuesday, October 13, 2020
Subject: Inverse Problems in Science and Engineering, Volume 28, Issue 11, November 2020 is now available online on Taylor & Francis Online

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Improving a Tikhonov regularization method with a fractional-order differential operator for the inverse black body radiation problem

Taináh M. R. Santos , Camila A. Tavares , Nelson H. T. Lemes , José P. C. dos Santos & João P. Braga

A numerical scheme based on discrete mollification method using Bernstein basis polynomials for solving the inverse one-dimensional Stefan problem
Soheila Bodaghi , Ali Zakeri & Amir Amiraslani

Identification of inelastic parameters of the AISI 304 stainless steel: a multi-test optimization strategy
M. Vaz Jr. & M. Tomiyama

The monotonicity method for the inverse crack scattering problem
Tomohiro Daimon , Takashi Furuya & Ryuji Saiin

Multidimensional inverse Cauchy problems for evolution equations
Mukhtar Karazym , Tohru Ozawa & Durvudkhan Suragan

Entropy binomial tree method and calibration for the volatility smile
Wenxiu Gong , Zuoliang Xu & Qinghua Ma

A synthesis method for path generation of a planar five-bar mechanism based on dynamic self-adaptive atlas database
Jianwei Sun , Na Xue , Wenrui Liu & Jinkui Chu

Numerical reconstruction of two-dimensional particle size distributions from laser diffraction data
Vladislav D. Ustinov & Evgeniy G. Tsybrov

Fatigue dynamic reliability and global sensitivity analysis of double random vibration system based on Kriging model
Qing Guo , Yongshou Liu , Xiaohan Liu , Bingqian Chen & Qin Yao

<https://www.tandfonline.com/toc/gipe20/28/11>

From: noreply@iopscience.org

Date: October 14, 2020

Subject: Inverse Problems, Volume 36, Number 10, October 2020

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Special Issue Articles:

Deep learning for 2D passive source detection in presence of complex cargo
W Baines, P Kuchment and J Ragusa

Generalized V-line transforms in 2D vector tomography
Gaik Ambartsoumian, Mohammad Javad Latifi Jebelli and Rohit Kumar Mishra

Papers:

Bayesian approach to inverse scattering with topological priors
Ana Carpio, Sergei Iakunin and Georg Stadler

On a regularization approach to the inverse transmission eigenvalue problem
S A Buterin, A E Choque-Rivero and M A Kuznetsova

Exterior Steklov eigenvalues and modified exterior Steklov eigenvalues in inverse scattering
Yuan Li

Uniqueness to inverse acoustic scattering from coated polygonal obstacles with a single incoming wave
Guang-Hui Hu and Manmohan Vashisth

Inverse scattering reconstruction of a three dimensional sound-soft axis-symmetric impenetrable object
Carlos Borges and Jun Lai

Numerical analysis of backward subdiffusion problems
Zhengqi Zhang and Zhi Zhou

Inverse electromagnetic obstacle scattering problems with multi-frequency sparse backscattering far field data
Tilo Arens, Xia Ji and Xiaodong Liu

Data-driven forward discretizations for Bayesian inversion
D Bigoni, Y Chen, N Garcia Trillos, Y Marzouk and D Sanz-Alonso

Well-conditioned ptychographic imaging via lost subspace completion
Anton Forstner, Felix Krahmer, Oleh Melnyk and Nada Sissouno

Wavefield reconstruction inversion: an example
William W Symes 2020

A time domain factorization method for obstacles with impedance boundary conditions
Housseem Haddar and Xiaoli Liu

<https://iopscience.iop.org/issue/0266-5611/36/10>
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