IPNet Digest Volume 28, Number 01 January 28, 2021
Today's Editor: Patricia (Patti) K. Lamm, Michigan State University
Today's Topics:
 ICERM Workshop: Safety & Security of Deep Learning (Unstable Neural Networks)
 PhD Position: Oversmoothing Regularization Models, Local Ill-Posedness, Siegen
 Special Issue Submissions: Advances in Computational Integral Equations
 Table of Contents: Inverse Problems
Submissions for IPNet Digest:
 Mail to ipnet-digest@math.msu.edu
Information about IPNet:
 http://ipnet.math.msu.edu

From: Ruth Crane ruth_crane@icerm.brown.edu [via NADIGEST] Date: January 11, 2021 Subject: Safety and Security of Deep Learning, ONLINE, Apr 2021

Deep learning is profoundly reshaping the research directions of entire scientific communities across mathematics, computer science, and statistics, as well as the physical, biological and medical sciences. Yet, despite their indisputable success, deep neural networks are known to be universally unstable. That is, small changes in the input that are almost undetectable produce significant changes in the output. This happens in applications such as image recognition and classification, speech and audio recognition, automatic diagnosis in medicine, image reconstruction and medical imaging as well as inverse problems in general. This phenomenon is now very well documented and yields non-human-like behaviour of neural networks in the cases where they replace humans, and unexpected and unreliable behaviour where they replace standard algorithms in the sciences.

The many examples produced over the last years demonstrate the intricacy of this complex problem and the questions of safety and security of deep learning become crucial. Moreover, the ubiquitous phenomenon of instability combined with the lack of interpretability of deep neural networks makes the reproducibility of scientific results based on deep learning at stake.

For these reasons, the development of mathematical foundations aimed at improving the safety and security of deep learning is of key importance. The goal of this workshop is to bring together experts from mathematics, computer science, and statistics in order to accelerate the exploration of breakthroughs and of emerging mathematical ideas in this area.

This ICERM workshop is fully funded by a Simons Foundation Targeted Grant to Institutes. Apply today! https://urldefense.com/v3/__https://icerm.brown.edu/events/htw-21-ssdl/__;!!HXCxUKc! l1JLeylvM8nOWxxQv5rmDJx2uAAfKXJnrBl_BDMW1fiQ2mlm2A4-tNHZAFjZWINw\$

From: plato@mathematik.uni-siegen.de" <plato@mathematik.uni-siegen.de>
Date: January 26, 2021
Subject: PhD Position at the University of Siegen (Germany)

PhD position at Siegen

The University of Siegen is offering a PhD position affiliated with the Department of Mathematics. It is associated with the DFG-funded research project 'Oversmoothing regularization models in light of local ill-posedness phenomena'.

The position should be filled by April 1, 2021 for a period of 3 years, with 75% of the regular working hours. Remuneration is according to the German public salary scale TV-L 13.

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For more information, see the official job advertisement web site
    https://urldefense.com/v3/__https://jobs.uni-siegen.de/job/Wissenschaftlicher-
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If you have any questions, please contact Prof. R.~Plato via E-mail: plato@mathematik.uni-siegen.de
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Application Deadline: February 17th 2021

Submitted by: Robert Plato Büro ENC B-209, Department Mathematik, Universität Siegen Walter-Flex-Str. 3, 57068 Siegen, Tel: (0271) 740 3591 Email: plato@mathematik.uni-siegen.de WWW: https://urldefense.com/v3/__http://www.uni-siegen.de/fb6/aan/plato__;!!HXCxUKc! ghAmfsfkCh-j2JaSuhqAwS2rPWD9HYMUROb0rIQ30h7g7enRm8ESmV078U1vJzBAMXJ-X0Y\$

From: Alex Barnett abarnett@flatironinstitute.org [via NADIGEST] Date: January 11, 2021 Subject: ACOM Special Issue on Integral Equations, Mar 2021

This is a reminder that we will be excited to consider article submissions from the international research community for the special issue (topical collection) "Advances in Computational Integral Equations" (ACIE), in the journal Advances in Computational Mathematics (ACOM). The deadline is approaching: March 31, 2021.

Topics of interest include: boundary integral equations, singular geometries, quadrature, randomized algorithms, high frequency waves, inverse problems, HPC, software packages, numerical analysis, time-domain...

The guest editorial board is: Stephanie Chaillat, Adrianna Gillman, Gunnar Martinsson, Michael O'Neil (chair), Alex Barnett, Mary-Catherine Kropinski, and Timo Betcke. Submissions will undergo ACOM's usual peer-review process.

For details:

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/content/18256174/data/v2__;!!HXCxUKc!hY60hfZwTOG2EceEpDIDbNVQooSVb9JAFV9vnoT6Cr0WcETOTVSgHSOlaZYLpdL\$

https://urldefense.com/v3/__https://www.springer.com/journal/10444__;!!HXCxUKc! hY60hfZwTOG2EceEpDIDbNVQooSVb9JAFV9vnoT6Cr0-WcETOTVSgHSOldcB-rgY\$

From: noreply@iopscience.org Date: December 31, 2020 at 7:53:54 PM PST Subject: Inverse Problems, Volume 37, Number 1, January 2021

Inverse Problems January 2021 Volume 37, Number 1 Table of Contents

Special Issue Papers:

An ADMM-LAP method for total variation myopic deconvolution of adaptive optics retinal images Xiaotong Chen, James L Herring, James G Nagy, Yuanzhe Xi and Bo Yu

Error analysis for filtered back projection reconstructions in Besov spaces M Beckmann, P Maass and J Nickel

Papers:

Stability estimates for the relativistic Schrödinger equation from partial boundary data

Soumen Senapati

Non-stationary multi-layered Gaussian priors for Bayesian inversion Muhammad Emzir, Sari Lasanen, Zenith Purisha, Lassi Roininen and Simo Särkkä

Scanning electron diffraction tomography of strain Robert Tovey, Duncan N Johnstone, Sean M Collins, William R B Lionheart, Paul A Midgley, Martin Benning and Carola-Bibiane Schönlieb

Ultrasound modulated bioluminescence tomography with a single optical measurement Francis Chung, Tianyu Yang and Yang Yang

Deep synthesis network for regularizing inverse problems Daniel Obmann, Johannes Schwab and Markus Haltmeier

An inverse potential problem for subdiffusion: stability and reconstruction Bangti Jin and Zhi Zhou

X-ray transform on Sobolev spaces Vladimir A Sharafutdinov

Tikhonov regularization for polynomial approximation problems in Gauss quadrature points

Congpei An and Hao-Ning Wu

An inverse random source problem for the one-dimensional Helmholtz equation with attenuation Peijun Li and Xu Wang

A mathematical model for image saturation with an application to the restoration of solar images via adaptive sparse deconvolution S Guastavino and F Benvenuto

The maximum entropy on the mean method for image deblurring Gabriel Rioux, Rustum Choksi, Tim Hoheisel, Pierre Maréchal and Christopher Scarvelis

Inverse initial boundary value problem for a non-linear hyperbolic partial differential equation Gen Nakamura, Manmohan Vashisth and Michiyuki Watanabe

Recovery of coefficients for a weighted p-Laplacian perturbed by a linear second order term Cătălin I Cârstea and Manas Kar

Recovering a quasilinear conductivity from boundary measurements Ravi Shankar

A direct method for solving inverse Sturm-Liouville problems Vladislav V. Kravchenko and Sergii M. Torba

https://iopscience.iop.org/issue/0266-5611/37/1
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