IPNet Digest Volume 29, Number 11 September 1, 2022 Today's Editor: Patricia (Patti) K. Lamm, Michigan State University Today's Topics: In Memoriam: James Vere Beck Postdoc: Machine Learning Models and Algorithms at Tufts Postdocs: ERC Advanced grant E-DUALITY at KU Leuven TT Positions: Numerical Methods for PDEs, incl. Inverse Problems, at KIT New Book: A Toolbox for Digital Twins: From Model-Based to Data-Driven Table of Contents: Applied Mathematics in Science and Engineering Submissions for IPNet Digest: Mail to ipnet-digest@math.msu.edu Information about IPNet: https://ipnet.math.msu.edu/

From: Keith Woodbury <keith.woodbury@woodburyeng.com>
Wednesday, August 31, 2022
Subject: Jim Beck

James Vere Beck, Professor Emeritus of Michigan State University, passed away on 28 July 2022 after a short illness at age 92. During his lifetime, Prof. Beck made significant contributions to the fields of parameter estimation, inverse problems, and conduction heat transfer with over 200 contributions to archival journals in these fields. He is well-known for his three seminal books: Parameter Estimation in Engineering and Science, Inverse Heat Conduction: Ill-posed problems, and Heat Conduction using Green's Functions. Prof. Beck initiated annual meetings on inverse problems at Michigan State (the Inverse Problems Symposium) which later evolved into triennial international meetings (the International Conference in Inverse Problems in Engineering). His warm personality and penchant for simple, direct approaches to solution of complex problems will be missed.

From: "Miller, Eric L" <Eric.Miller@tufts.edu>
Date: Tuesday, August 23, 2022
Subject: Machine Learning Post doctoral Opening

Tufts University has openings for a post-doctoral researcher to engage in a cross-cutting project focusing on the development of machine learning models and algorithms to advance precision medicine in the area of anti-microbial resistance (AMR); i.e., the increasing ability of bacteria, fungi, and other micro-organisms to develop resistance to a range of antibiotics and other drugs. Current work is focused on the development of combination therapies adapted to the specifics of the case-in-hand. Such efforts lead naturally to a pair of related learning problems: prediction of clinical outcomes from a given course of treatment and determination of an optimal treatment strategy (which

drugs in which amounts as a function of time) to achieve a desired clinical outcome both of which are hampered by the availability of relatively small sets of data. The project will involve collaboration with investigators with expertise in machine learning and signal processing, basic cell biology and biological engineering, as well as clinical immunology and infectious disease.

Applicants must have a PhD in electrical engineering, computer science, applied mathematics, statistics, or a similar field. The ideal candidates will have experience with and a publication record in one or more of the following areas: modern methods of statistical signal processing, machine learning, optimization, or data science. Programming experience in Matlab or python is preferred.

For more information about this position, please email Prof. Eric Miller (eric.miller@tufts.edu) and Prof. Bree Aldridge (bree.aldridge@tufts.edu). Interested candidates should provide Prof. Miller with a copy of their CV, list of references, cover letter, and copies of relevant articles, theses, technical reports etc.

Submitted by: Eric L. MillerDirector, Tufts Institute for Artificial Intelligence Professor of Electrical and Computer Engineering Professor of Computer Science, Secondary Appointment Professor of Mathematics, Secondary Appointment Professor of Biomedical Engineering, Secondary Appointment Contact: email, zoom, calendar Phone: 617.627.0835 Office: Joyce Cummings Center, Room 616 Ground mail: Halligan Hall, 161 College Ave., Medford Ma, 02155

From: johan.suykens@esat.kuleuven.be Date: Tuesday, August 30, 2022 Subject: Postdoc positions KU Leuven (ERC Advanced grant E-DUALITY)

The research group KU Leuven ESAT-STADIUS is currently offering 2 Postdoc (1 year, extendable) positions within the framework of the ERC (European Research Council) Advanced Grant E-DUALITY https://urldefense.com/v3/__http://www.esat.kuleuven.be/stadius/E__;!!HXCxUKc! yJJx3nspn0_YdrlivCALJn09Cp3nf-SgLv8TBndAx87qbu9cUz2csxIQCB-XVxsluG9lAd0TDJm_cV54fqcNr-cw_KgMtqb5XZw8ULE\$ (PI: Johan Suykens) on Exploring Duality for Future Data-driven Modelling.

Within this ERC project E-DUALITY we aim at realizing a powerful and unifying framework (including e.g. kernel methods, support vector machines, deep learning, networks, tensor-based models and others) for handling different system complexity levels, obtaining optimal model representations and designing efficient algorithms.

The research positions relate to the following possible topics: 1- Duality principles 2- Multiple data sources and coupling schemes

3- Manifold learning and semi-supervised schemes

4- Optimal prediction schemes

5- Scalability, on-line updating, interpretation and visualization

6- Mathematical foundations

7- Matching model to system characteristics

For further information and on-line applying, see https://urldefense.com/v3/__https://www.kuleuven.be/personeel/jobsite/jobs/ 60153047__;!!HXCxUKc!yJJx3nspn0_YdrlivCALJn09Cp3nf-SgLv8TBndAx87qbu9cUz2csxIQCB-XVxsluG9lAd0TDJm_cV54fqcNr-cw_KgMtqb5le355Rc\$ (click EN for English version).

The research group ESAT-STADIUS https://urldefense.com/v3/__http://www.esat.kuleuven.be/stadius__;!!HXCxUKc! yJJx3nspn0_YdrlivCALJn09Cp3nf-SgLv8TBndAx87qbu9cUz2csxIQCB-XVxsluG9lAdOTDJm_cV54fqcNr-cw_KgMtqb5ClZlJ9Q\$ at the university KU Leuven Belgium provides an excellent research environment being active in the broad area of mathematical engineering, including data-driven modelling, neural networks and machine learning, nonlinear systems and complex networks, optimization, systems and control, signal processing, bioinformatics and bio-medicine.

From: Marlis Hochbruck marlis.hochbruck@kit.edu [via NA-Digest] Date: August 18, 2022 Subject: Tenure Track Position, Numerical methods for PDEs, KIT

Karlsruhe Institute of Technology invites applications for a tenure-track professorship (W1) for numerical methods for partial differential equations. Possible research areas are space discretization, time discretization, inverse problems, optimization or uncertainty quantification. A relation to wave phenomena is mandatory. Participation in the research focus "Partial Differential Equations" and the Collaborative Research Center 1173 "Wave Phenomena" at the Department of Mathematics is expected.

Employment will initially be for a period of six years. If the final tenure evaluation is positive, the successful candidate will be promoted to the rank of tenured full professor (W3).

Deadline for applications is September 7, 2022. More information about the position and how to apply can be found here:

https://urldefense.com/v3/__https://www.pse.kit.edu/english/karriere/joboffer .php?id=81225&new=true__;!!HXCxUKc!

0YwUP50hKn5amtueCZqB16Hu8WRUVu013TQrkdC4g4w6P4WTl5CBTSMJJmSBIBXdqob1yyG70oNQSBA0 qwtFDJtF6-qNHTp7yD8\$

From: Mitch Graham mgraham@siam.org [via NA-Digest] Date: August 05, 2022

Subject: New Book, A Toolbox for Digital Twins

A Toolbox for Digital Twins: From Model-Based to Data-Driven by Mark Asch

This book brings together the mathematical and numerical frameworks needed for developing digital twins. Starting from the basics — nprobability, statistics, numerical methods, optimization, and machine learning — and moving on to data assimilation, inverse problems, and Bayesian uncertainty quantification, the book provides a comprehensive toolbox for digital twins. Emphasis is also placed on the design process, denoted as the "inference cycle," the aim of which is to propose a global methodology for complex problems.

July 2022 / xxiv + 832 pages / Softcover / 978-1-611976-96-0 / Price \$120.00

Bookstore Link: https://urldefense.com/v3/__https://my.siam.org/Store/Product/viewproduct/? ProductId=41813926__;!!HXCxUKc! 0YwUP50hKn5amtueCZqB16Hu8WRUVu013TQrkdC4g4w6P4WTl5CBTSMJJmSBIBXdqob1yyG70oNQSBA0 qwtFDJtF6-qNJ80PkXk\$

From: "alerts@tandfonline.com" <alerts@tandfonline.com> Date: Thursday, September 1, 2022 Subject: Contents, Applied Mathematics in Science and Engineering, Volume 30, Issue 1

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