

TW-Colloquium



Professor Martin Burger

Applied Mathematics, University of Münster

Motion-Corrected Dynamic Tomography

WED, 24 FEB, 12:45
BUILDING RAVELIJN, RA1501



Brown Bag Lunch Talks

Lunch bags will be provided 10min before

Motion-Corrected Dynamic Tomography

Abstract: We will discuss the problem of reconstructing the density of a moving subject from sparse angular measurements at each time step, a problem naturally appearing in dynamic CT and in PET imaging. After a brief introduction to inverse problems in medical imaging, we present appropriate models for the motion together with advanced variational regularization techniques for jointly reconstructing motion and images. We discuss their mathematical properties, numerical solution, practical applications, and some limitations (sample rate vs. motion speed, initial guesses). Finally we comment on the potential incorporation of (partial) motion information from other modalities as e.g. used in PET-MR imaging.

Short CV:

- Born August 1976 in Wels, Austria. Married to Bettina, daughters Sanna and Enni.
- Studies of Mathematics at Johannes Kepler University Linz and University of Milano, Diploma 1998.
- PhD in Mathematics at Johannes Kepler University Linz, 2000.
- Pre- and Postdoc Researcher at SFB Numerical and symbolic scientific computing, Johannes Kepler University Linz, 1999-2000.
- Civil service at Hilfswerk Austria, Linz, 2001
- Assistant Researcher, Industrial Mathematics Institute, Johannes Kepler University Linz, 2002-2003 and 2004-2006
- CAM Assistant Professor, UCLA, 2003-2004
- Scientific Advisor, RICAM Linz, 2005-2006
- Habilitation (venia docendi), Johannes Kepler University Linz, 2005
- Full Professor for Applied Mathematics, Westfälische Wilhelms-Universität Münster, since 2006

Memberships, Honors:

- Member of the Editorial Board of [Inverse Problems](#)
- Member of the Editorial Board of [European Journal of Applied Mathematics](#)
- Member of the Editorial Board of [Journal of Mathematical Imaging and Vision](#)
- Member of the Editorial Board of [Mathematics of Computation](#)
- Member of the Editorial Board of Springer Lecture Notes on Mathematical Modelling in the Life Sciences
- Founding Member of the European Institute for Molecular Imaging, Münster, 2007.
- Cluster of Excellence Cells in Motion: PI, Scientific Steering Committee Member, and Executive Board Member, since 2012.
- Co-Chair of the GAMM Interest Group on Mathematical Signal and Image Processing, since 2015.
- Calderon Prize of the Inverse Problems International Association (IPIA), 2009.
- ERC Consolidator Grant 2013.
- Call to a Full Professor Position for Computational Biology, Felix-Klein Zentrum, TU Kaiserslautern, 2009 (declined).
- Call to Director Position of the Weierstrass Institute for Analysis and Stochastics, 2014 (declined).