



Jan Philipp Dietrich

Curriculum Vitae

Experience

Vocational

- since 10/2008 **Researcher**, *Potsdam Institute for Climate Impact Research (PIK)*.
Development and application of an economic land-use model
- since 12/2011 **Group leader**, *research software engineering group "model operations"*,
Sustainable Solutions, Potsdam Institute for Climate Impact Research (PIK).
Increasing efficiency, transparency and reproducibility of models and model development,
achieving synergies in model development, standardization, technical support

Miscellaneous

- 7/2002–5/2003 **civilian service**, *"Christliche Erholungshäuser Bethanien"*,
Langeoog (Niedersachsen, Germany).
- 2/2004–7/2005 **research assistant**, *research group "Applied Condensed-Matter Physics"*
of Prof. Dr. Reimund Gerhard, Potsdam University.
Charging and measuring the properties of charge-storing polymers
- 2006–2007 **webmaster**, *"Physikalisches Grundpraktikum"*, Potsdam University.

Education

school education

- 1989–1993 **primary school**, *"Jung-Stilling-Schule"*, Ewersbach (Hessen, Germany).
- 1993–2002 **secondary school**, *"Wilhelm-von-Oranien-Gymnasium"*,
Dillenburg (Hessen, Germany).
- 6/2002 **Abitur**, *advanced courses in mathematics and chemistry*, mark 2.2.

academic studies

- 10/2003–7/2008 **studying physics**, *Potsdam University*, Potsdam (Brandenburg, Germany).
specialisation in Nonlinear Dynamics
- summer 2005 **intermediate diploma**, mark 1.7.
- 8/2007–2/2008 **semester abroad**, *Umeå University*, Umeå (Sweden).
attending courses in Nanotechnology and Robotics
- 2/2008–7/2008 **diploma thesis**, mark 1.1.
- 7/2008 **graduation in physics (diploma)**, mark 1.2 *"with distinction"*.

10/2008–10/2011 **Ph.D. student**, *Humboldt University Berlin / Potsdam Institute for Climate Impact Research (PIK)*.

10/2011 **Ph.D. in physics**, *Humboldt University Berlin, magna cum laude*.

Diploma thesis - University of Potsdam

title *Phase Space Reconstruction using the frequency domain - a generalization of actual methods*

supervisors Prof. Dr. Frank Spahn – Potsdam University
Prof. Dr. Bernd Blasius – University of Oldenburg (ICBM)

URN urn:nbn:de:kobv:517-opus-50738

description Phase Space Reconstruction is a method that allows to reconstruct the phase space of a system using only an one dimensional time series as input. There are several functions that can be used for reconstruction. I demonstrate that all these different transformations can be expressed in frequency space as $\tilde{x}_n(\omega) = f(\omega) \cdot \tilde{x}(\omega)$, where \tilde{x} is a known input \tilde{x}_n the reconstructed output and $f(\omega)$ a generalized reconstruction function.

PhD thesis - Humboldt University Berlin

title *Efficient treatment of cross-scale interactions in land-use model*

supervisors Prof. Dr. Dr. h.c. Jürgen Kurths – Humboldt University
Prof. Dr. Hermann Held – University of Hamburg
Prof. Dr. Karlheinz Erb – Alpen-Adria University

DOI 10.18452/16395

description Computer models have become a common tool in various disciplines. A major challenge in modeling is the linking of processes on different scales. Neglecting cross-scale interactions leads to biases in model projections while a 1:1 representation is computationally infeasible. Therefore, a good balance between accuracy and abstraction is essential. I investigate efficient implementations of cross-scale interactions in agricultural land-use models. I focus on two dominant aspects: First, the inclusion of spatially explicit data in a global optimization model; second, the proper representation of technological change as a driver for land use change. As a consequence of limitations in complexity of global optimization models the problem arises that high-resolution data cannot be used directly as model input. Typically, the spatially explicit data is upscaled by using a static upscaling rule. As an alternative I discuss the use of clustering methods for upscaling. I provide a general framework including the creation of clusters, the upscaling of inputs, and the downscaling of outputs. My investigations show that the information loss due to upscaling decreases significantly with cluster methods compared to static grids. Another important process in agriculture is technological change. Whereas in the past increases in agricultural production were mainly achieved by agricultural land expansion, nowadays most increases in total production are outcome of intensification due to technological change. To model this feedback I introduce a measure for agricultural land-use intensity. Based on this measure I show that the effectiveness of investments in technological change decreases with the agricultural land-use intensity. My findings imply that apart from detailedness especially the implementation has a significant impact on general model quality. Therefore, in model development the framework used for implementation should be emphasized to a greater extent.

List of conducted courses

- 2004–2005 **tutor**, *private tutoring in mathematics and theoretical physics*.
support for fellow students during my undergraduate studies (SS2004, WS2004/2005, SS2005)
- 2005–2007 **tutor**, *"Tutorium für Erstsemester"*, Potsdam University.
tutoring freshman students in their first year in Physics at Potsdam University (WS2005/2006, SS2006, WS2006/2007)

Languages

- German first language
English fluidly *UNlcert III: mark 1.7*
Swedish basics

Computer skills

- Numerical computing R, GAMS, MATLAB, gnuplot
Programming C, C++, Python, QBasic, Visual Basic, Pascal, Delphi
Webdesign HTML, JavaScript, PHP, Perl

Interests

- freeclimbing
- speedminton
- photography
- virtual reality

Awards

- 2008–2010 **Festival of Lights Berlin**, *photo competitions 2008–2010*, awarded for pictures "Deutscher Dom" (2008), "Oberbaumbrücke" (2009) and "Beisheim-Center" (2010).
- 2011 **PIK best dissertation of the year**, *awarded by the Society of Friends and Promoters of the Potsdam Institute for Climate Impact Research e.V.*

More information

- Profile @ PIK pik-potsdam.de/members/dietrich
GitHub github.com/tscheypidi
Google Scholar scholar.google.de/citations?user=O4NrklAAAAAJ
Group @ PIK pik-potsdam.de/research/sustainable-solutions/research/model-operations