Jan Philipp Dietrich

Curriculum Vitae

Experience

Vocational

since Aug 2022 **Group Co-Lead**, *"Land-Use Management"*,
Transformation Pathways, Potsdam Institute for Climate Impact Research (PIK)
Coordinating state of the art global land-use modelling research from a Research Software Engineering perspective and improving representations of cross-scale dynamics.

since 2008 **Researcher**, *Potsdam Institute for Climate Impact Research (PIK)*
Research software engineering and development of an economic land-use model

2019–2022 **Group Co-Lead**, *"Research Software Engineering for Transformation Pathways"*,
Transformation Pathways, Potsdam Institute for Climate Impact Research (PIK)
Increase quality of software-driven research, including but not exclusive to their usability, credibility, performance, reproducibility and robustness.

2011–2018 **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 delevopment, achieving synergies in model development, standardization, technical support

Miscellaneous

since 2019 **Land Use Modelling Consultant**
Building and improving land-use modeling capacities at companies and institutions.

2006–2007 **Webmaster**, *"Physikalisches Grundpraktikum"*, Potsdam University

2004–2005 **Research Assistant**, *research group "Applied Condensed-Matter Physics" of Prof. Dr. Reimund Gerhard*, Potsdam University
Charging and measuring the properties of charge-storing polymers

2002–2003 **Civilian Service**, *"Christliche Erholungshäuser Bethanien"*,
Langeoog (Niedersachsen, Germany)

Education

academic studies

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

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

2008 **graduation in physics (diploma)**, *mark 1.2 "with distinction"*

Alt Nowawes 39 – 14482 Potsdam, Germany
+49 160 9827 6832 • *jpdietrich@online.de*
pik-potsdam.de/members/dietrich

2008 **diploma thesis**, *mark 1.1*

2007–2008 **semester abroad**, *Umeå University*, Umeå (Sweden)
attending courses in Nanotechnology and Robotics

2005 **intermediate diploma**, *mark 1.7*

2003–2008 **studying physics**, *Potsdam University*, Potsdam (Brandenburg,Germany)
specialisation in nonlinear dynamics and modeling

school education

2002 **Abitur**, *advanced courses in mathematics and chemistry*, *mark 2.2*

1993–2002 **secondary school**, *"Wilhelm-von-Oranien-Gymnasium"*, Dillenburg (Hessen, Germany)

1989–1993 **primary school**, *"Jung-Stilling-Schule"*, Ewersbach (Hessen, Germany)

PhD thesis - Humboldt University Berlin

title *Efficient treatment of cross-scale interactions in aland-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 challenge is the linking of processes on different scales where negligence can lead to biases in model projections. 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 aspects: First, the inclusion of spatially explicit data in a global model; second, technological change as a driver for land use change. Due to 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 via simple upscaling rules. An alternative is the use of clustering methods. 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.

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 serveral 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.

Languages

German	first language	
English	fluid	*UNIcert 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
- photography
- speedminton
- virtual reality

Awards

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*

2008–2010 **Festival of Lights Berlin**, *photo competitions 2008–2010*, awarded for pictures "Deutscher Dom" (2008), "Oberbaumbrücke" (2009) and "Beisheim-Center" (2010)

More information

Profile @ PIK	pik-potsdam.de/members/dietrich
GitHub	github.com/tscheypidi
Google Scholar	scholar.google.de/citations?user=O4NrkIAAAAAJ
Group @ PIK	pik-potsdam.de/research/transformation-pathways/research/research-software-engineering

Alt Nowawes 39 – 14482 Potsdam, Germany
+49 160 9827 6832 • jpdietrich@online.de
pik-potsdam.de/members/dietrich