DR. MANUEL BAUMANN

Applied Mathematician & Scientific Programmer

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EXPERIENCE

Postdoctoral Research

Max Planck Institute for Dynamics of Complex Technical Systems

Apr 2018 – ongoing | Magdeburg, GER

- Project: *Consistent Optimization and Stabilization of Power Networks*
- Industrial partners: TenneT TSO GmbH, ENSO NETZ GmbH, Venios GmbH, Energy Saxony e. V.
- Main focus: Numerical optimization, Model-Order Reduction

Doctoral Research

Delft University of Technology

July 2013 – Jan 2018 | Delft, NL

- Project: *Fast Iterative Solution of the Time-Harmonic Elastic Wave Equation at Multiple Frequencies*
- Industrial partner: Shell Global Solutions International B.V.
- Main focus: Numerical Linear Algebra, Optimal Control, and Computational Geophysics

Scientific Programmer (internship)

German Aerospace Center DLR

June 2009 – Sep 2009 | Braunschweig, GER

- Coupled Flow-Structure Simulations with MPI

EDUCATION

M.Sc. in Applied Mathematics (double degree program)

Delft University of Technology

Aug 2011 – June 2013 | Delft, NL

M.Sc. in Scientific Computing (double degree program)

Royal Institute of Technology

Aug 2011 – June 2013 | Stockholm, SE

B.Sc. in Mathematics

Technical University of Berlin

Oct 2008 – Aug 2011 | Berlin, GER

B.Sc. in Engineering Science

Technical University of Berlin

Oct 2007 - March 2011 | Berlin, GER

LIFE PHILOSOPHY

"Good things don't come to those who wait."

MOST PROUD OF

SIAM Student Chapter
I co-founded the SIAM Student Chapter at TU Delft and served as the first president.

International Collaborations
During my research, I collaborated with colleagues from China, Singapore, Venezuela, France and The Netherlands.

Inter-cultural Understanding
I lived and studied in three different countries of Europe.

Project baNaNa
We organize technical 'baNaNa' talks for PhD students in Numerical Analysis.

STRENGTHS & HOBBIES

Hard-working | Disciplined | Innovative | Communicative

Race biking | Outdoor | Skiing instructor | Traveling

PROGRAMMING SKILLS

Python	●●●●●
MATLAB	●●●●●
Fortran 90	●●●●○
git	●●●●○
MPI/CUDA	●●●○○

LANGUAGES

German (native)	●●●●●
English	●●●●●
Dutch	●●●○○
French	●●○○○

PUBLICATIONS

Journal Articles

- Baumann, M. and Martin B. van Gijzen (2018). “Convergence and complexity study of GMRES variants for solving mulit-frequency elastic wave propagation problems”. In: *J. Comput. Sci.* DOI: 10.1016/j.jocs.2018.03.004.
- Baumann, Manuel, Peter Benner, and Jan Heiland (2018). “Space-time Galerkin POD with application in optimal control of semi-linear parabolic partial differential equations”. In: *SIAM J. Sci. Comput.* (accepted for publication).
- Baumann, Manuel, Reinaldo Astudillo, Yue Qiu, Elisa Ang, Martin B. van Gijzen, and René-Édouard Plessix (2017). “An MSSS-Preconditioned Matrix Equation Approach for the Time-Harmonic Elastic Wave Equation at Multiple Frequencies”. In: *Computat. Geosci.* 22.1, pp. 43–61.
- Baumann, Manuel and Martin B. Van Gijzen (2015). “Nested Krylov methods for shifted linear systems”. In: *SIAM J. Sci. Comput.* 37.5, S90–S112.

Technical Reports

- Baumann, Manuel and Martin B. van Gijzen (2017a). *An Efficient Two-Level Preconditioner for Multi-Frequency Wave Propagation Problems*. Tech. rep. DIAM Report 17-03 (under review).

Conference Proceedings

- Baumann, Manuel and Martin B. van Gijzen (2017b). “Efficient iterative methods for multi-frequency wave propagation problems: A comparison study”. In: *Procedia Comput. Sci.* Vol. 108, pp. 645–654.
- Baumann, Manuel and Martin B. Van Gijzen (2016). “A Fast Iterative Solution of the Time-harmonic Wave Equation with MSSS-preconditioned IDR(s)”. In: *Proceedings of 78th EAGE Conference & Exhibition*.
- Baumann, Manuel, Jan Heiland, and Michael Schmidt (2015). “Discrete Input/Output Maps and their Relation to Proper Orthogonal Decomposition”. In: *Numerical Algebra, Matrix Theory, Differential-Algebraic Equations and Control Theory*. Ed. by Peter Benner, Matthias Bollhöfer, Daniel Kressner, Christian Mehl, and Tatjana Stykel. Springer International Publishing, pp. 585–608.

Doctoral Thesis

- Baumann, Manuel (2017). “Fast Iterative Solution of the Time-Harmonic Elastic Wave Equation at Multiple Frequencies”. ISBN 978-94-6295-827-2: Delft University of Technology.

REFEREES

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