

MANUEL M. BAUMANN

Applied Mathematician & Scientific Programmer

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EXPERIENCE

Doctoral Research

Delft University of Technology

July 2013 – Ongoing Delft, NL

- Thesis title: *Fast Iterative Solution of the Time-Harmonic Elastic Wave Equation at Multiple Frequencies*
- Scientific supervision: Martin B. Van Gijzen (TU Delft) and René-Édouard Plessix (Shell International)
- My research interests include: Numerical Linear Algebra, Model-Order Reduction, Optimal Control and Parallel Programming

Student Research Assistant

Technical University of Berlin

Oct 2009 – Aug 2011 Berlin, GER

- Modeling, Simulation, and Control of Drop Size Distributions in Stirred Liquid/Liquid Systems

Internship as Scientific Programmer

German Aerospace Center

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

Within my PhD 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.

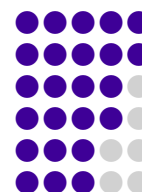
STRENGTHS

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, 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.* DOI: 10.1007/s10596-017-9667-7.
 - Baumann, Manuel and Martin B. van Gijzen (2017b). “Efficient iterative methods for multi-frequency wave propagation problems: A comparison study”. In: *Procedia Comput. Sci.* 108, pp. 645–654.
 - – (2015). “Nested Krylov methods for shifted linear systems”. In: *SIAM J. Sci. Comput.* 37.5, S90–S112.
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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].
 - Baumann, Manuel, Peter Benner, and Jan Heiland (2016). *Space-time Galerkin POD with application in optimal control of semi-linear parabolic partial differential equations*. Tech. rep. arXiv:1611.04050 [under review].
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Conference Proceedings

- 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.

REFEREES

Dr. Martin B. Van Gijzen

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