

# PAUL SCHWERDTNER

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## WORK EXPERIENCE

01/2020 - TODAY

**SCIENTIFIC ASSISTANT** | TECHNISCHE UNIVERSITÄT BERLIN, CHAIR OF NUMERICAL MATHEMATICS

Development and implementation of algorithms for robust control of large and sparse systems

10/2018 - 01/2021

**RESEARCH SCIENTIST** | NEUROCAT (STARTUP-COMPANY, BERLIN),

Machine learning research, investigation of adversarial robustness of deep Convolutional networks  
Development and implementation of algorithms for robust control of large and sparse systems

04/2018 - 09/2018

**RESEARCH INTERN** | MITSUBISHI ELECTRIC RESEARCH LABORATORIES, CAMBRIDGE (MASSACHUSETTS),

Control systems research, development of algorithms for robust constraint control of air conditioning systems

11/2015 - 03/2016

**RESEARCH INTERN** | CONTINENTAL, SILAO (MEXICO)

Analysis and optimization of production parameters for injection molding using an artificial neural net as research and development intern

## EDUCATION

04/2018

**MASTER OF SCIENCE** | TECHNISCHE UNIVERSITÄT BERLIN

Thesis: On Fixed Order H-Infinity Controller Design for Delay Systems  
Specialization: numerical mathematics and simulation, mechatronics

09/2016

**BACHELOR OF SCIENCE** | TECHNISCHE UNIVERSITÄT BERLIN

Thesis: Numerical Simulation of non-autonomous Dynamical Systems to Investigate Disk-Brake Squeal

## **PRIZES AND EXTRA CURRICULAR ACTIVITIES**

01/2020: GAMM Junior (award including a membership at the International Association of Applied Mathematics and Mechanics for young researchers with excellent master thesis in the fields of Applied Mathematics or Mechanics)

10/2018-03/2019: Funding by research fellowship from the Berlin international school for model and simulation based research

10/2017: Prize for outstanding bachelor degree awarded by the Association of German Engineers

10/2013 - 09/2016: Funded by scholarship Deutschlandstipendium

## **ACADEMIC PUBLICATIONS**

### **PREPRINTS:**

2020/11 P. Schwerdtner, M. Voigt. Structure Preserving Model Order Reduction by Parameter Optimization

2020/11 P. Schwerdtner, F. Greßner, N. Kapoor, F. Assion, R. Sass, W. Günther, F. Hüger, P. Schlicht. Risk Assessment for Machine Learning Models

2020/10 R. S. Beddig, P. Benner, I. Dorschky, T. Reis, P. Schwerdtner, M. Voigt, S. Werner. Structure-preserving model reduction for dissipative mechanical systems

### **PUBLISHED:**

2020/10 M. W. H. Böse, D. Hildebrand, F. Beuer, C. Wesemann, P. Schwerdtner, S. Pieralli, B. C. Spies. Root-analogue implants for immediate implant placement: A retrospective case series. *Clinical Oral Implants Research*, 2020.

11/2019 R. S. Beddig, P. Benner, I. Dorschky, T. Reis, P. Schwerdtner, M. Voigt, and S. Werner. Model Reduction for Second-Order Dynamical Systems Revisited. *Proc. Appl. Math. Mech.*, November 2019.

06/2019 S. A. Bortoff, P. Schwerdtner, C. Danielson, and S. Di Cairano. H-Infinity Loop-Shaped Model Predictive Control with Heat Pump Application. 18th European Control Conference (ECC), pp. 2386–2393, 2019.

06/2019 P. Schwerdtner, S. A. Bortoff, C. Danielson, and S. Di Cairano. Projection-Based Anti-Windup for Multivariable Control with Heat Pump Application. 18th European Control Conference (ECC), pp. 1281–1287, 2019.

09/2018 P. Schwerdtner, and M. Voigt. Computation of the  $L^\infty$ -norm Using Rational Interpolation. Joint 9th IFAC Symposium on Robust Control Design.

10/2017 N. Aliyev, P. Benner, E. Mengi, P. Schwerdtner, and M. Voigt. A Greedy Subspace Method for Computing the  $L^\infty$ -norm. *Proc. Appl. Math. Mech.*, Oktober 2017.

08/2017 N. Aliyev, P. Benner, E. Mengi, P. Schwerdtner, and M. Voigt. Large-Scale Computation of  $L^\infty$ -norms by a Greedy Subspace Method. *SIAM J. Matrix Anal. Appl.*, 38(4):1496–1516, 2017.

### **ACADEMIC TALKS**

08/2019 Structure Preserving or Realization Independent  $H^\infty$  Approximation at the 4th Workshop on Model Reduction of Complex Dynamical Systems in Graz (Austria)

06/2019 Projection-Based Anti-Windup for Multivariable Control with Heat Pump Application at the European Control Conference in Naples (Italy)

02/2019 Fixed Order H-infinity Controller Design for Delay Systems at the 90th Annual Meeting of the International Association of Applied Mathematics and Mechanics in Vienna (Austria)