Alexander Popp
(Univ.-Prof. Dr.-Ing.)

Institute for Mathematics and Computer-Based Simulation (IMCS)
University of the Bundeswehr Munich
85577 Neubiberg / Germany

phone	+49-(0)89-6004-3082
fax	+49-(0)89-6004-4136
e-mail	alexander.popp@unibw.de
date of birth	9 September 1982
nationality	German
family status	married

Professional Experience

since 01/2018 — **Full Professor**
Institute for Mathematics and Computer-Based Simulation,
University of the Bundeswehr Munich (UniBw M),
Head of the *Computer-Based Simulation Group* within the
Department of Civil Engineering and Environmental Science

since 04/2014 — **Technology Consultant (part-time)**
AdCo Engineering^{GW} GmbH, Garching,
Consulting activities and research and development for a startup company in computational mechanics and engineering

09/2017 – 10/2017 — **Visiting Professor**
Research group MUSAM (Head: Prof. M. Paggi)
IMT School for Advanced Studies Lucca, Italy

08/2017 – 12/2017 — **TUM Junior Fellow and Research Group Leader**
Department of Mechanical Engineering, Technical University of Munich (TUM) and Center Digitization.Bavaria (ZD.B)

03/2017 – 06/2017 — **Visiting Associate Research Scientist**
Department of Civil Engineering (Head: Prof. G. Deodatis),
Columbia University in the City of New York, U.S.A.

10/2015 – 08/2017 — **Deputy Head of Institute and Lecturer**
Institute for Computational Mechanics (Head: Prof. W. Wall), TUM,
Research group on *Contact and Structural Mechanics*,
Independent supervision of 6 doctoral candidates

03/2015 – 10/2015 — **Visiting Research Fellow**
Institute of Industrial Science (Head: Prof. M. Oshima),
The University of Tokyo, Japan

09/2012 – 03/2015 — **Senior Research Associate and Lecturer**
Institute for Computational Mechanics, TUM

10/2007 – 09/2012 — **Research Associate**
Institute for Computational Mechanics, TUM

Curriculum Vitae

Education

09/2012	**Ph.D. Mechanical Engineering (Dr.-Ing.), TUM** Doctoral thesis: "Mortar methods for computational contact mechanics and general interface problems", Passed with high distinction (*summa cum laude*), Examination committee: Prof. K. Drechsler (chairman), Prof. W.A. Wall, Prof. M.W. Gee, Prof. T.A. Laursen (examiners)
09/2007	**Diploma Mechanical Engineering (Dipl.-Ing. Univ.), TUM** Specialization in lightweight structures and product development, Passed with high distinction (*summa cum laude*), GPA 1.0
08/2006 – 12/2006	**LAOTSE Postgraduate Scholarship, HKUST** Postgraduate engineering studies at the Hong Kong University of Science and Technology (HKUST), People's Republic of China
10/2004	**Intermediate Examination Mechanical Engineering, TUM** Passed with high distinction (*summa cum laude*), GPA 1.2, Ranked no. 1 out of 461 examinees
06/2001	**High School Diploma (Abitur), Adalbert-Stifter-Gymnasium Passau** Passed with high distinction (*summa cum laude*), GPA 1.0

Work Experience

07/2005 – 10/2005	BMW Group, Munich, *internship*
02/2004 – 03/2004	eug GmbH, Garching, *internship*
07/2002 – 08/2002	ZF Passau GmbH, Passau, *internship*
09/2001 – 06/2002	Passau Clinical Center, Passau, *civilian service*

Honors and Awards

07/2017	Junior Research Group of the **Center Digitization.Bavaria (ZD.B)** Only 7 out of 82 applicants were selected for this program
06/2016	Elected as chairman of the **Young Investigators Committee** of the European Community on Computational Methods in Applied Sciences (ECCOMAS)
02/2016	Fellowship (24 months) of the **Daimler and Benz Foundation** Only 12 out of 200 applicants were selected for this program
04/2010 & 07/2015	**Teaching Awards** within the annual teaching evaluation of the Department of Mechanical Engineering, TUM
03/2015	Postdoctoral Fellowship (6 months) of the **German Academic Exchange Service (DAAD)**
02/2015	Postdoctoral Fellowship (36 months) of the European Commission in the **Marie-Sklodowska-Curie Program (MSCA-GF)** – *declined*
08/2014	Postdoctoral Fellowship (24 months) of the **Japanese Society for the Promotion of Science (JSPS)** – *declined*
12/2005 – 09/2007	Scholarship of the **TUM Mentoring Program** Only 150 out of 20,000 students were supported in this program

10/2005 – 09/2007	Full scholarship of the **German National Academic Foundation** Less than 1% of all students were granted this scholarship
07/2005	**Rudolf Diesel Award** of TUM and AMIV e.V. Awarded for an excellent student paper in engineering
10/2002 – 09/2005	Full scholarship of the **Bavarian State Government** Less than 1% of all students were granted this scholarship
06/2001	**Best Diploma Award** of the City of Passau Awarded for the best high school diploma in 2001

Professional Service and Memberships

06/2017 –	**Member** German Association of University Professors and Lecturers (DHV)
06/2016 –	**Chairman** Young Investigators Committee of the European Community for Computational Methods in Applied Sciences (ECCOMAS)
06/2013 – 12/2016	**Secretary General** German Association for Computational Mechanics (GACM)
02/2013 –	**Mentor for Ph.D. students** TUM Graduate School and International Graduate School of Science and Engineering (IGSSE)
11/2012 –	**Member** German Association for Computational Mechanics (GACM), International Association for Computational Mechanics (IACM), European Mechanics Society (EUROMECH)
09/2011 – 11/2011	**Ph.D. Student Representative** Evaluation of TUM within the Excellence Initiative by the German federal and state governments
07/2010 –	**Scientific Referee** Peer-review service for more than 20 of the leading international journals and funding agencies in engineering science
02/2008 – 10/2010	**Project Manager** Development of the integrative research center *Munich School of Engineering* for interdisciplinary research and cross-faculty teaching at TUM and the new bilingual B.Sc. program *Engineering Science*
09/2005 –	**Member** Association of German Engineers (VDI)

Further Information

Languages	German (first language) English (level C2), French (level B2), Japanese (level A1)
Software	C/C++, Java, Python, Matlab, Office, LaTeX, Windows, Linux, FEA (Abaqus/Standard, Abaqus/Explicit, Ansys, LS-Dyna), software development on several HPC platforms

Teaching Experience

- *Nonlinear Finite Element Methods*, lecture
  Department of Civil Engineering and Environmental Science, UniBw M
  spring term 2018
- *Advanced Chapters in Numerics*, lecture
  Department of Civil Engineering and Environmental Science, UniBw M
  spring term 2018
- *Introduction to Finite Element Methods*, lecture
  Department of Civil Engineering and Environmental Science, UniBw M
  winter term 2018
- *Computational Contact and Interface Mechanics*, lecture
  Department of Mechanical Engineering, TUM
  winter term 2017/18
  winter term 2016/17
- *Geometrically Nonlinear and Contact Analysis,* lecture
  TH Ingolstadt and HAW Landshut
  winter term 2017/18
  winter term 2016/17
- *Computational Solid and Fluid Dynamics*, lecture
  Munich School of Engineering, TUM
  winter term 2017/18
  winter term 2016/17
  winter term 2012/13
- *Nonlinear Finite Element Methods*, lecture
  Department of Mechanical Engineering, TUM
  summer term 2016
  summer term 2014
  summer term 2013
- *Virtual Worlds*, advanced training for high school teachers
  Department of Mechanical Engineering, TUM
  summer term 2016
  summer term 2013
- *Nonlinear Continuum Mechanics*, lecture
  Department of Mechanical Engineering, TUM
  winter term 2015/16
  winter term 2014/15
  winter term 2013/14
- *Engineering Mechanics 3 – Dynamics,* lecture
  Department of Mechanical Engineering, TUM
  winter term 2013/14 – selected chapters (with W.A. Wall)
- *Engineering Mechanics 2 – Elastostatics,* lecture
  Department of Mechanical Engineering, TUM
  summer term 2013 – selected chapters (with W.A. Wall)

- *Engineering Mechanics 1 – Statics*, lecture
  Department of Mechanical Engineering, TUM
  winter term 2012/13 – selected chapters (with W.A. Wall)
- *Computational Mechanics Summer School*, invited lectures
  COMMAS Program, University of Stuttgart
  summer term 2012
- *Engineering Mechanics,* exercises and tutorials
  Department of Mechanical Engineering, TUM
  summer term 2009
  winter term 2008/09

Teaching Certification

- Teaching in Higher Education of the Bavarian Universities *("Zertifikat Hochschullehre")*
  Advanced certificate, 120 working units, TUM, 2016
- Teaching in Higher Education of the Bavarian Universities *("Zertifikat Hochschullehre")*
  Basic certificate, 60 working units, TUM, 2016

Evaluation Results

- Computational Contact and Interface Mechanics — grade: 1.3
  winter term 2017/18
- Geometrically Nonlinear and Contact Analysis — grade: 1.3
  winter term 2017/18
- Computational Solid and Fluid Dynamics — grade: 1.5 (average: 2.1)
  winter term 2017/18
- Computational Contact and Interface Mechanics — grade: 1.5 (average 2.0)
  winter term 2016/17
- Geometrically Nonlinear and Contact Analysis — grade: 1.4
  winter term 2016/17
- Computational Solid and Fluid Dynamics — grade: 1.3 (average 2.0)
  winter term 2016/17
- *Nonlinear Finite Element Methods* — grade: 1.6 (average: 2.1)
  summer term 2016
- *Nonlinear Continuum Mechanics* — grade: 1.5 (average: 2.2)
  winter term 2015/16
- *Nonlinear Continuum Mechanics* — grade: 1.5 (average: 2.1)
  winter term 2014/15 – *Teaching Award "Goldene Lehre"*
- *Nonlinear Finite Element Methods* — grade: 1.6 (average: 2.0)
  summer term 2014
- *Nonlinear Continuum Mechanics* — grade: 2.0 (average: 2.1)
  winter term 2013/14
- *Nonlinear Finite Element Methods* — grade: 1.6
  summer term 2013
- *Computational Solid and Fluid Dynamics* — grade: 1.5
  winter term 2012/13
- *Engineering Mechanics 2: Elastostatics* — grade: 1.3 (average: 1.6)
  summer term 2009 – *Teaching Award "Goldene Lehre"*
- *Engineering Mechanics 1: Statics* — grade: 1.3 (average: 1.7)
  winter term 2008/09

Supervised Ph.D. Students (independent supervision)

- *Nonlinear finite element formulations for beam-to-solid contact interaction*
  (Ivo Steinbrecher, University of the Bundeswehr Munich, since 2018)

Supervised Ph.D. Students (accountable supervision)

- *A novel smooth discretization approach for elasto-plastic contact*
  (Alexander Seitz, Institute for Computational Mechanics, TUM, since 2013)
  together with W.A. Wall
- *Robust nonlinear solution techniques for computational contact mechanics*
  (Michael Hiermeier, Institute for Computational Mechanics, TUM, since 2013)
  together with W.A. Wall
- *Hydroplaning of car tires on rough road surfaces*
  (Julien Gillard, in collaboration with Goodyear S.A., 2012-2018)
  together with W.A. Wall
- *Elastohydrodynamic lubrication and fluid-structure-contact interaction*
  (Andy Wirtz, Institute for Computational Mechanics, TUM, 2012-2017)
  together with W.A. Wall
- *Complex interface modeling including friction, wear and thermomechanics*
  (Philipp Farah, Institute for Computational Mechanics, TUM, 2013-2017)
  together with W.A. Wall
- *Geometrically exact finite elements for slender beams and beam-to-beam contact*
  (Christoph Meier, Institute for Computational Mechanics, TUM, 2012-2016)
  together with W.A. Wall

Mentoring of Ph.D. Students in TUM Graduate School

- Dong Li, Institute of Applied Mechanics, TUM, since 2017
- Michael Häußler, Institute of Applied Mechanics, TUM, since 2015
- Anna Birzle, Institute for Computational Mechanics, TUM, since 2015
- Maximilian Grill, Institute for Computational Mechanics, TUM, since 2014
- Dhrubajyoti Mukherjee, Institute for Computational Mechanics, TUM, since 2014
- Christoph Ager, Institute for Computational Mechanics, TUM, since 2014
- Andy Wirtz, Institute for Computational Mechanics, TUM, since 2014
- Julien Gillard, Goodyear S.A., since 2013

Supervised B.Sc. Students and M.Sc. Students

- *Beam-to-solid contact modeling for the stent graft / arterial wall contact*
  (Florian Kammerstetter, Munich School of Engineering, TUM, 2017)
- *Bottom-up modeling of AAA stent grafts for endovascular repair*
  (Johannes Kremheller, Institute for Computational Mechanics, TUM, 2016)
- *Reduced modeling of AAA stent grafts for endovascular repair*
  (Sebastian Büchner, in collaboration with University of Tokyo, Japan, 2016)

Teaching

- *Mortar mesh tying of ALE and fluid fields with partial sliding*
  (Michael Häußler, Institute for Computational Mechanics, TUM, 2015)
- *Modeling of deformable crash barriers for lumped mass models*
  (Michael Pabst, in collaboration with IDIADA GmbH and BMW Group, 2014)
- *Contact between beams and rigid bodies / elastic solid bodies*
  (Michael Hofer, Institute for Computational Mechanics, TUM, 2014)
- *Particle contact simulations with the discrete element method*
  (Niklas Fehn, Institute for Computational Mechanics, TUM, 2013)
- *Finite-strain elastoplasticity and contact*
  (Alexander Seitz, Institute for Computational Mechanics, TUM, 2013)
- *Simulating the interaction of pantograph and catenary*
  (Fabian Sewerin, in collaboration with Bombardier Transportation GmbH, 2013)
- *Numerical integration for 3D mortar contact formulations*
  (Philipp Farah, Institute for Computational Mechanics, TUM, 2012)
- *Energy conservation for mortar contact formulations*
  (Andy Wirtz, Institute for Computational Mechanics, TUM, 2012)
- *Explicit time integration schemes for contact problems*
  (Roman Feger, Institute for Computational Mechanics, TUM, 2011)
- *Crash modeling concepts for passenger cars*
  (Thomas Knyrim, in collaboration with BMW Group, 2011)
- *Consistent dual Lagrange multipliers for 3D mortar contact*
  (Alexander Seitz, Institute for Computational Mechanics, TUM, 2011)
- *Consistent dual Lagrange multipliers for 2D mortar contact*
  (Sebastian Zenz, Institute for Computational Mechanics, TUM, 2011)
- *Different sliding laws on embedded interfaces*
  (Matthias Mayr, in collaboration with Duke University, USA, 2010)
- *Momentum conservation for mortar contact formulations*
  (Fabian Sewerin, Institute for Computational Mechanics, TUM, 2010)
- *Nonlinear 3D contact formulations for beam structures*
  (Matthias Mayr, Institute for Computational Mechanics, TUM, 2009)
- *Search algorithms for the finite element simulation of self-contact*
  (Anh-Tu Vuong, Institute for Computational Mechanics, TUM, 2009)
- *Mortar contact formulations with penalty regularization*
  (Bernd Budich, Institute for Computational Mechanics, TUM, 2009)
- *Efficient 3D contact search algorithms*
  (Thomas Eberl, Institute for Computational Mechanics, TUM, 2009)

Research Interests

- Computational contact dynamics
- Computational structural dynamics
- Computational fluid dynamics
- Fluid-structure interaction
- Volume- and surface-coupled multi-field problems
- Tribology and elastohydrodynamic lubrication
- Multi-scale modeling
- Material modeling
- Mechanics of slender continua (beams and shells)
- Model reduction / dimensional reduction
- Cardiovascular tissue mechanics
- Biomedical mechanical technology (stent grafts)
- Modeling with stochastic uncertainties
- Bayesian multi-fidelity uncertainty quantification
- Non-conforming discretization techniques
- Domain decomposition and mortar methods
- Extended finite element methods (XFEM, CutFEM)
- Isogeometric analysis
- Finite element technology
- High performance parallel computing
- Software development

Organization of Scientific Events

- *Main Organizer*
  Minisymposium on "Computational Mechanics in Complex Product Development", with M. Zimmermann and F. Duddeck, IACM World Congress on Computational Mechanics, New York City, U.S.A., 2018
- *Member of the Scientific Committee*
  9th Contact Mechanics International Symposium, Biella, Italy, 2018
- *Main Organizer*
  "Science Slam", with S. Elgeti and J.-W. Simon, ECCOMAS European Conference on Computational Mechanics, Glasgow, U.K., 2018
- *Main Organizer*
  Minisymposium for "European Young Investigators", with J. Baiges, L. Chamoin, S. Elgeti, F. van der Meer and J.-W. Simon, ECCOMAS European Conference on Computational Mechanics, Glasgow, U.K., 2018
- *Main Organizer*
  Minisymposium on "New Challenges in Computational Contact Mechanics", with A. Gay Neto, A.B. Harish and P. Wriggers, ECCOMAS European Conference on Computational Mechanics, Glasgow, U.K., 2018
- *Co-Organizer and Lecturer*
  Advanced Course on "Computational Structural Dynamics", with R. Kolman
  ECCOMAS Advanced Course, Prague, Czech Republic, 2018
- *Main Organizer*
  Minisymposium on "Computational Contact Mechanics", with C. Hesch, A. Tkachuk and C. Wilking, GACM Colloquium on Computational Mechanics, Stuttgart, Germany, 2017
- *Member of the Scientific Committee*
  ECCOMAS Young Investigators Conference, Milan, Italy, 2017
- *Member of the Scientific Committee*
  8th International Conference on Computational Methods (ICCM), Guilin, China, 2017
- *Main Organizer and Lecturer*
  Advanced Course on "Computational Contact and Interface Mechanics", with P. Wriggers
  CISM – International Center for Mechanical Sciences, Udine, Italy, 2016
- *Main Organizer*
  Minisymposium for "European Young Investigators", with J. Baiges and J. Simon
  ECCOMAS Congress, Crete Island, Greece, 2016
- *Main Organizer*
  Minisymposium on "Computational Contact Mechanics", with C. Hesch and R. Sauer
  ECCOMAS Young Investigators Conference, Aachen, Germany, 2015
- *Member of the Organizing Committee*
  3rd German-Japanese Workshop on Computational Mechanics:
  Joint workshop of GACM and JSCES, Munich, Germany, 2015

Reviewing Activities for International Journals

- International Journal for Numerical Methods in Engineering
- Computer Methods in Applied Mechanics and Engineering
- Computational Mechanics
- Computational Particle Mechanics
- Computers and Structures
- SIAM Journal of Scientific Computing
- Journal of Computational and Applied Mathematics
- Finite Elements in Analysis and Design
- International Journal of Computational Methods
- Journal of Engineering Mechanics (ASCE)
- Journal of Mechanical Science and Technology
- Mechanics of Advanced Materials and Structures
- Computational Materials Science
- International Journal of Mechanical Sciences
- International Journal for Numerical and Analytical Methods in Geomechanics
- Advances in Mechanical Engineering
- Materials
- Materials Research
- Shock and Vibrations
- Communications in Nonlinear Science and Numerical Simulation
- ZAMM Zeitschrift für Angewandte Mathematik und Mechanik

Reviewing Activities for Research Agencies

- European Research Council: ERC Advanced Grant Call 2017, Panel PE8

Projects and Funding as Principal Investigator

- *Multi-Scale Modeling of Friction for Large-Scale Engineering Problems*
  € 20,000 / 2 years, 2018 – 2020
  German Academic Exchange Service (DAAD), Germany
  In collaboration with IMT School for Advances Studies Lucca, Italy
- *A Simulation-Based Digital Toolchain for Patient-Specific Surgery Planning and Risk Prediction in Endovascular Repair (EVAR) of Abdominal Aortic Aneurysms (AAA)*
  € 1,171,000 / 5 years, 2017 – 2022
  Bavarian State Ministry of Education, Science and the Arts (StMBW), Germany
  In the framework of the Center Digitization.Bavaria (ZD.B)
- *Experimental Characterization and Numerical Simulation of the Automated Fiber Placement (AFP) Process for Thermoplastic Fiber-Reinforced Plastics*
  € 274,000 / 3 years, 2017 – 2020, PO 1883/3-1
  German Research Foundation (DFG), Germany
  In collaboration with Institute for Carbon Composites, TUM
- *Bottom-Up Modeling of Self-Expandable Stent Grafts for Endovascular Repair of AAA*
  € 40,000 / 2 years, 2016 – 2018
  Daimler and Benz Foundation, Germany
  Postdoctoral research fellowship
- *CISM Advanced Course – Computational Contact and Interface Mechanics*
  € 25,000 / one-time, 2016
  International Center for Mechanical Sciences (CISM), Italy
- *Travel Grant for ECCOMAS Young Investigators Conference 2015*
  € 1,400 / one-time, 2015
  German Academic Exchange Service (DAAD), Germany
- *Improved Lifetime Prediction Tools for Fretting Wear and Fatigue*
  € 255,000 / 3 years, 2015 – 2017
  Federal Ministry of Economics and Technology (BMWi), Germany
  In collaboration with Rolls-Royce, Germany and Rolls-Royce plc., U.K.
- *Advanced Finite Element Modeling of Arterial Stent Placement Procedures*
  € 25,000 / 6 months, 2015
  German Academic Exchange Service (DAAD), Germany
  Short-term postdoctoral research fellowship
- *A Novel Smooth Discretization Approach for Elasto-Plastic Contact*
  € 246,000 / 3 years, 2014 – 2017, PO 1883/1-1
  German Research Foundation (DFG), Germany
  In collaboration with Institute for Numerical Mathematics, TUM

Projects and Funding as Contributor

- *Development, Numerical Simulation and Experimental Characterization of Selective Laser Melting (SLM) Microstructures with Deliberately Introduced Dissipation*
  Contribution: Co-Applicant
  € 500,000 / 3 years, 2017 – 2020 (under review)
  German Research Foundation (DFG), Germany
  In collaboration with Institute for Machine Tools and Industrial Management, TUM
- *New Linux Cluster for the Institute for Computational Mechanics, TUM – State Major Instrumentation Program ("Großgeräte der Länder")*
  Contribution: Proposal Submission
  € 350,000 / one-time, 2015
  German Research Foundation (DFG), Germany
- *Components of Rocket Engines for Applications in Space Transport Systems: Subproject 2400 – Fluid-Structure Interaction in Turbopumps*
  Contribution: Project Manager
  € 265,000 / 3 years, 2015 – 2017
  Bavarian Ministry of Economic Affairs and Media, Energy and Technology, Germany
  In collaboration with Airbus Defence and Space, Germany and several TUM institutes
- *Method Developments for CFD including their Application to Multiphysics*
  Contribution: Proposal Submission and Project Manager
  10,000,000 CPU-h / 3 years, 2014 – 2017
  Leibniz Supercomputing Centre (LRZ), Germany
- *Optimized Partitioned FSI Algorithms for Tire Hydroplaning Physics*
  Contribution: Project Manager
  € 186,000 / 3 years, 2012 – 2015
  Fonds National de la Recherche – AFR Grant, Luxembourg
  In collaboration with Goodyear S.A., Luxembourg
- *Interaction of Aerodynamics and Vehicle Driving Dynamics*
  Contribution: Project Manager
  € 277,000 / 3 years, 2009 – 2012
  BMW Group, Germany
- *Dynamics and Structure Formation in Active Actin Networks*
  Contribution: Project Team Leader
  € 233,000 / 4 years, 2010 – 2014
  International Graduate School of Science and Engineering, TUM
- *Contact Modeling in Turbine Blade-to-Disc Joints*
  Contribution: Proposal Submission and Lead Developer
  € 495,000 / 5 years, 2007 – 2012
  Federal Ministry of Economics and Technology (BMWi), Germany
  In collaboration with Rolls-Royce, Germany and Rolls-Royce plc., U.K.

Overview and Citation Metrics

- 1 edited volume (as responsible editor)
- 27 articles in peer-reviewed scientific journals (plus 1 currently under review)
- 6 peer-reviewed proceedings articles and book contributions
- > 35 invited and contributed presentations at international conferences / workshops
- > 690 citations in total / h-Index 14 (Google Scholar)
- > 400 citations in total / h-Index 11 (Scopus)

Edited Volumes

[1] Popp, A., Wriggers, P. (Eds.): Computational Contact Modeling for Solids and Particles, CISM International Centre for Mechanical Sciences, Springer, in print

Peer-Reviewed International Journal Articles

[2] Pauw, J.D., Veggi, L., Haidn, O.J., Wagner, C., Thümmel, T., Rixen, D., Ager, C., Wirtz, A., Popp, A., Wall, W.A., Wagner, B. (2018): An academic approach to the multidisciplinary development of liquid oxygen turbopumps for space applications, *CEAS Space Journal*, Preprint, submitted for publication

[3] Seitz, A., Wall, W.A., Popp, A. (2018): A computational approach for thermo-elasto-plastic frictional contact based on a monolithic formulation employing non-smooth nonlinear complementarity functions, *Advanced Modeling and Simulation in Engineering Sciences*, published online, DOI: 10.1186/s40323-018-0098-3

[4] Fang, R., Farah, P., Popp, A., Wall, W.A. (2018): A monolithic, mortar-based interface coupling and solution scheme for finite element simulations of lithium-ion cells, *International Journal for Numerical Methods in Engineering*, published online, DOI: 10.1002/nme.5792

[5] Meier, C., Grill, M.J., Wall, W.A., Popp, A. (2018): Geometrically exact beam elements and smooth contact schemes for the modeling of fiber-based materials and structures, *International Journal of Solids and Structures*, published online, DOI: 10.1016/j.ijsolstr.2017.07.020

[6] Farah, P., Wall, W.A., Popp, A. (2018): A mortar finite element approach for point, line and surface contact, *International Journal for Numerical Methods in Engineering*, published online, DOI: 10.1002/nme.5743

[7] Wiesner, T.A., Popp, A., Gee, M.W., Wall, W.A. (2018): Algebraic multigrid methods for dual mortar finite element formulations in contact mechanics, *International Journal for Numerical Methods in Engineering*, published online, DOI: 10.1002/nme.5748

[8] Meier, C., Popp, A., Wall, W.A. (2017): Geometrically exact finite element formulations for slender beams: Kirchhoff-Love theory vs. Simo-Reissner theory, *Archives of Computational Methods in Engineering*, published online, DOI: 10.1007/s11831-017-9232-5

[9] Meier, C., Wall, W.A., Popp, A. (2017): A unified approach for beam-to-beam contact, *Computer Methods in Applied Mechanics and Engineering*, 315:972-1010

[10] Farah, P., Wall, W.A., Popp, A. (2017): An implicit finite wear contact formulation based on mortar methods, *International Journal for Numerical Methods in Engineering*, 111:325-353

[11] Meier, C., Popp, A., Wall, W.A. (2016): A finite element approach for the line-to-line contact interaction of thin beams with arbitrary orientation, *Computer Methods in Applied Mechanics and Engineering*, 308:377-413

[12] Farah, P., Vuong, A.-T., Wall, W.A., Popp, A. (2016): Volumetric coupling approaches for multiphysics simulations on non-matching meshes, *International Journal for Numerical Methods in Engineering*, 108:1550-1576

[13] Seitz, A., Farah, P., Kremheller, J., Wohlmuth, B., Wall, W.A., Popp, A. (2016): Isogeometric dual mortar methods for computational contact mechanics, *Computer Methods in Applied Mechanics and Engineering*, 301:259-280

[14] Pasquariello, V., Hammerl, G., Örley, F., Hickel, S. Danowski, C., Popp, A., Wall, W.A., Adams, N.A. (2016): A cut-cell finite volume – finite element coupling approach for fluid-structure interaction in compressible flow, *Journal of Computational Physics*, 307:670-695

[15] Farah, P., Gitterle, M., Wall, W.A., Popp, A. (2016): Computational wear and contact modeling for fretting analysis with isogeometric dual mortar methods, *Key Engineering Materials*, 681:1-18

[16] Meier, C., Popp, A., Wall, W.A. (2015): A locking-free finite element formulation and reduced models for geometrically exact Kirchhoff rods, *Computer Methods in Applied Mechanics and Engineering*, 290:314-341

[17] Seitz, A., Popp, A., Wall, W.A. (2015): A semi-smooth Newton method for orthotropic plasticity and frictional contact at finite strains, *Computer Methods in Applied Mechanics and Engineering*, 285:228-254

[18] Farah, P., Popp, A., Wall, W.A. (2015): Segment-based vs. element-based integration for mortar methods in computational contact mechanics, *Computational Mechanics*, 55:209-228

[19] Popp, A., Wall, W.A. (2014): Dual mortar methods for computational contact mechanics – overview and recent developments, *GAMM-Mitteilungen*, 37(1):66-84

[20] Meier, C., Popp, A., Wall, W.A. (2014): An objective 3D large deformation finite element formulation for geometrically exact curved Kirchhoff rods, *Computer Methods in Applied Mechanics and Engineering*, 278:445-478

[21] Ehrl, A., Popp, A., Gravemeier, V., Wall, W.A. (2014): A mortar approach with dual Lagrange multipliers for mesh tying within a variational multiscale method for incompressible flow, *International Journal for Numerical Methods in Fluids*, 76:1-27

[22] Popp, A., Seitz, A., Gee, M.W., Wall, W.A. (2013): A dual mortar approach for improved robustness and consistency of 3D contact algorithms, *Computer Methods in Applied Mechanics and Engineering*, 264:67-80

[23] Popp, A., Wohlmuth, B.I., Gee, M.W., Wall, W.A. (2012): Dual quadratic mortar finite element methods for 3D finite deformation contact, *SIAM Journal on Scientific Computing*, 34:B421-B446

[24] Wohlmuth, B.I., Popp, A., Gee, M.W., Wall, W.A. (2012): An abstract framework for a priori estimates for contact problems in 3D with quadratic finite elements, *Computational Mechanics*, 49:735-747

[25] Klöppel, T., Popp, A., Küttler, U., Wall, W.A. (2011): Fluid-structure interaction for non-conforming interfaces based on a dual mortar formulation, *Computer Methods in Applied Mechanics and Engineering*, 200:3111-3126

[26] Mayer, U.M., Popp, A., Gerstenberger, A., Wall, W.A. (2010): 3D fluid-structure-contact interaction based on a combined XFEM FSI and dual mortar contact approach, *Computational Mechanics*, 46:53-67

[27] Gitterle, M., Popp, A., Gee, M.W., Wall, W.A. (2010): Finite deformation frictional mortar contact using a semi-smooth Newton method with consistent linearization, *International Journal for Numerical Methods in Engineering*, 84:543-571

[28] Popp, A., Gitterle, M., Gee, M.W., Wall, W.A. (2010): A dual mortar approach for 3D finite deformation contact with consistent linearization, *International Journal for Numerical Methods in Engineering*, 83:1428-1465

[29] Popp, A., Gee, M.W., Wall, W.A. (2009): A finite deformation mortar contact formulation using a primal-dual active set strategy, *International Journal for Numerical Methods in Engineering*, 79:1354-1391

Peer-Reviewed Proceedings and Book Contributions

[30] Popp, A., Gee, M.W., Wall, W.A. (2013): Mortar methods for single-field and multi-field applications in computational mechanics, In: *Sustained Simulation Performance 2012*, pp. 133-154, M. Resch et al. (Eds.), Springer-Verlag, Germany

[31] Popp, A., Gee, M.W., Wall, W.A. (2013): A primal-dual active set strategy for finite deformation dual mortar contact, In: *Lecture Notes in Applied and Computational Mechanics*, 56:151-171, G.E. Stavroulakis (Ed.), Springer-Verlag, Germany

[32] Klöppel, T., Popp, A., Wall, W.A. (2011): Interface treatment in computational fluid-structure interaction, In: *Proceedings of the ECCOMAS Thematic Conference on Computational Methods in Structural Dynamics and Earthquake Engineering (COMPDYN 2011)*, M. Papadrakakis, N.D. Lagaros, M. Fragiadakis (Eds.), Corfu, Greece

[33] Popp, A., Wall, W.A. (2011): Computational contact dynamics including multiphysics and multiscale effects, In: *Proceedings of the ECCOMAS Thematic Conference on Compu-tational Methods in Structural Dynamics and Earthquake Engineering (COMPDYN 2011)*, M. Papadrakakis, N.D. Lagaros, M. Fragiadakis (Eds.), Corfu, Greece

[34] Popp, A., Gee, M.W., Wall, W.A. (2010): Finite deformation contact based on a 3D dual mortar and semi-smooth Newton approach, In: *Lecture Notes in Applied and Computational Mechanics*, 58:57-77, G. Zavarise, P. Wriggers (Eds.), Springer-Verlag, Germany

[35] Popp, A., Gitterle, M., Gee, M.W., Wall, W.A. (2009): A mortar method for finite deformation frictional contact using a primal-dual active set strategy, In: *Computational Plastcity X - Fundamentals and Applications, Proceedings of the 10th International Conference on Computational Plasticity (COMPLAS 2009)*, E. Onate, D.R.J. Owen, B. Suarez (Eds.), Barcelona, Spain

Other Articles and Book Contributions

[36] Popp, A., Wall, W.A. (2013): Mortar methods for computational contact mechanics and general interface problems, *IACM expressions*, 33:10-13

[37] Westfall, J., Maute, K.K, Klöppel, T., Popp, A., Gitterle, M., Wall, W.A. (2011): Nonlinear multi-physics coupling for non-conforming interfaces based on a dual mortar formulation, In: *DFG Sonderforschungsbereich / TR 40, Proceedings of the Summer Program 2011*, N.A. Adams et al. (Eds.), München, Germany

[38] Klöppel, T., Popp, A., Wall, W.A. (2010): Fluid-structure interaction for non-conforming interfaces based on a dual mortar formulation, In: *DFG Sonderforschungsbereich / TR 40, Annual Report 2010*, N.A. Adams et al. (Eds.), München, Germany

Ph.D. Thesis

[39] Popp, A. (2012): Mortar methods for computational contact mechanics and general interface problems, Institute for Computational Mechanics, Report No. 14, TUM

Diploma Thesis

[40] Popp, A. (2007): Modeling of crash barriers and development of a honeycomb material formulation, BMW Group and Institute for Computational Mechanics, TUM

Selected Presentations

[1] Popp, A. (2017): Mortar finite element methods for interface problems in nonlinear solid mechanics, **invited**, *Computational Solid Mechanics Lab Seminar Series, EPFL Lausanne, Lausanne*, Switzerland, December 5, 2017

[2] Popp, A., Meier, C., Wall, W.A., Oshima, M. (2017): New contact algorithms for nonlinear beam finite elements and their application to stent graft modeling, **invited**, *MUSAM Lab Seminar Series, IMT School for Advanced Studies*, Lucca, Italy, October 24, 2017

[3] Popp, A. (2017): Contact and interface modeling in nonlinear solid mechanics with mortar finite element methods, **invited**, *MUSAM Lab Seminar Series, IMT School for Advanced Studies*, Lucca, Italy, October 17, 2017

[4] Popp, A., Farah, P., Wall, W.A. (2017): Mortar-based contact formulations for non-smooth geometries, **invited**, *7th GACM Colloquium on Computational Mechanics (GACM2017)*, Stuttgart, Germany, October 11-13, 2017

[5] Popp, A., Meier, C., Wall, W.A., Oshima, M. (2017): Nonlinear contact modeling for geometrically exact beam finite element formulations, **invited (plenary lecture)**, *4th ECCOMAS Young Investigators Conference (YIC)*, Milan, Italy, September 13-15, 2017

[6] Popp, A., Wall, W.A, Seitz, A. (2017): Combining isogeometric and finite element analysis - isogeometric contact surfaces for finite elements, **contributed**, *ECCOMAS Thematic Conference on Modern Finite Element Technologies (MFET2017)*, Bad Honnef, Germany, August 21-23, 2017

[7] Popp, A., Meier, C., Oshima, M. (2017): Novel contact algorithms for nonlinear beam models - beam-to-beam contact, beam-to-solid mesh tying and beam-to-solid contact, **contributed**, *5th International Conference on Computational Contact Mechanics (ICCCM)*, Lecce, Italy, July 5-7, 2017

[8] Popp, A., Meier, C., Oshima, M. (2017): Bottom-up modeling of stent grafts for endovascular repair of AAA, **invited**, *4th Japanese-German Workshop on Computational Mechanics*, Sendai, Japan, March 27-28, 2017

[9] Popp, A., Meier, C., Wall, W.A. (2016): A unified framework for beam-to-beam contact interaction, **invited (minisymposium)**, *12th World Congress on Computational Mechanics (WCCM2016)*, Seoul, Korea, July 25-29, 2016

[10] Popp, A., Meier, C., Oshima, M. (2016): Bottom-up modeling of AAA stent grafts and stent placement procedures, **invited (keynote lecture)**, *7th European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS2016)*, Hersonissos, Greece, June 5-10, 2016

[11] Popp, A. (2016): Interface modeling in computational mechanics, *Habilitation Presentation, Technical University of Munich*, Garching, Germany, April 21, 2016

[12] Popp, A. (2015): Mortar finite element methods in computational (contact) mechanics, **invited**, *Workshop of the Profile Area Computational Science and Engineering (CompSE), RWTH Aachen University*, Aachen, Germany, December 14, 2015

[13] Popp, A. (2015): Mortar finite element methods for solid mechanics, fluid dynamics and coupled problems, **invited**, *Special Seminar on Science and Engineering, Department of Civil and Environmental Engineering, Chuo University*, Tokyo, Japan, September 29, 2015

[14] Popp, A., Meier, C., Wall, W.A. (2015): A finite element approach for arbitrarily complex contact interaction of geometrically exact 3D Kirchhoff beams, **contributed**, *3rd ECCOMAS Young Investigators Conference (YIC)*, Aachen, Germany, July 20-23, 2015

[15] Popp, A. (2015): Mortar finite element methods for computational contact mechanics: Towards complex real-world applications, **invited (plenary lecture)**, *4th Int. Conference on Computational Contact Mechanics (ICCCM)*, Hannover, Germany, May 27-29, 2015

[16] Popp, A. (2015): Computational contact mechanics: Overview of current and future research directions, **invited**, *Oshima Lab Seminar Series, Institute of Industrial Science, The University of Tokyo*, Tokyo, Japan, April 27, 2015

[17] Popp, A., Farah, P., Wiesner, T., Wall, W.A. (2014): Efficient parallel solution methods for mortar finite element discretizations in computational contact mechanics, **invited (minisymposium)**, *11th World Congress on Computational Mechanics (WCCM)*, Barcelona, Spain, July 21-25, 2014

[18] Popp, A., Seitz, A., Wall, W.A. (2014): Nonlinear complementarity functions and semi-smooth Newton methods for elastoplastic frictional contact at finite strains, **contributed**, *6th Contact Mechanics International Symposium (CMIS)*, Abu Dhabi, United Arab Emirates, February 3-5, 2014

[19] Popp, A., Farah, P., Seitz, A., Wall, W.A. (2013): Improved robustness and efficiency of mortar-based finite element discretizations for nonlinear contact problems, **contributed**, *3rd International Conference on Computational Contact Mechanics (ICCCM)*, Lecce, Italy, July 10-12, 2013

[20] Popp, A., Wall, W.A. (2013): Parallel efficiency and dynamic load balancing of mortar finite element methods, **contributed**, *2nd European Trilinos User Group Meeting (EuroTUG)*, Garching, Germany, June 3-5, 2013

[21] Popp, A., Gee, M.W., Wall, W.A. (2013): Mortar finite element methods for non-matching meshes in contact dynamics, fluid dynamics and fluid-structure interaction, **invited (minisymposium)**, *84th Annual Meeting of the International Association of Applied Mathematics and Mechanics (GAMM)*, Novi Sad, Serbia, March 18-22, 2013

[22] Popp, A. (2012): Mortar finite element methods for general interfaces in solid mechanics, fluid mechanics and coupled problems, **invited (keynote lecture)**, *SPOMECH Workshop*, Ostrava, Czech Republic, November 21-23, 2012

[23] Popp, A. (2012): Dual mortar approach and semi-smooth Newton methods for computational contact mechanics, **invited (keynote lecture)**, *SPOMECH Workshop*, Ostrava, Czech Republic, November 21-23, 2012

[24] Popp, A., Gee, M.W., Wall, W.A. (2012): Dual mortar contact formulations: new extensions for improved robustness and parallel efficiency, **invited (minisymposium)**, *10th World Congress on Computational Mechanics (WCCM)*, São Paulo, Brazil, July 8-13, 2012

[25] Wall, W.A., Popp, A. (2012): Computational contact mechanics in multiphysics environments, **invited (plenary lecture)**, *10th World Congress on Computational Mechanics (WCCM)*, São Paulo, Brazil, July 8-13, 2012

[26] Popp, A., Wohlmuth, B.I., Gee, M.W., Wall, W.A. (2012): 3D computational contact analysis using quadratic mortar finite element methods and dual Lagrange multiplier spaces, **contributed**, *Euromech 514: New trends in contact mechanics*, Cargèse, France, March 27-31, 2012

[27] Popp, A., Wall, W.A. (2012): Dynamic load balancing of mortar finite element methods for single-field and multi-field applications, **invited**, *Workshop on Sustained Simulation Performance*, Sendai, Japan, March 22-23, 2012

[28] Popp, A., Wall, W.A. (2011): Mortar finite element methods for computational contact dynamics and multiphysics simulations, **invited**, *14th Teraflop Workshop of HLRS Stuttgart and NEC*, Stuttgart, Germany, December 5-6, 2011

[29] Popp, A., Gitterle, M., Klöppel, T., Gee, M.W., Wall, W.A. (2011): Coupling of non-conforming interface meshes in contact dynamics and fluid-structure interaction using mortar methods, **invited (minisymposium)**, *11th International Conference on Computational Plasticity (COMPLAS)*, Barcelona, Spain, September 7-9, 2011

[30] Popp, A., Gitterle, M., Gee, M.W., Wall, W.A. (2011): Mortar methods with dual Lagrange multipliers for 3D finite deformation contact and multiphysics simulations, **contributed**, *2nd International Conference on Computational Contact Mechanics (ICCCM)*, Hannover, Germany, June 15-17, 2011

[31] Popp, A., Wall, W.A. (2011): Consistent treatment of 3D finite deformation contact within a fixed-grid fluid-structure interaction framework, **invited (minisymposium)**, *16th International Conference on Finite Elements in Flow Problems (FEF)*, Munich, Germany, March 23-25, 2011

[32] Popp, A., Gee, M.W., Wohlmuth, B.I., Wall, W.A. (2011): The mortar method with dual Lagrange multipliers: application to 3D finite deformation contact and quadratic elements, **invited (minisymposium)**, *20th International Conference on Domain Decomposition Methods (DDM)*, San Diego, USA, February 7-11, 2011

[33] Popp, A., Mayer, U.M., Wall, W.A. (2010): A computational approach for fluid-structure-contact interaction and elastohydrodynamic lubrication, **contributed**, *8th Euromech Fluid Mechanics Conference (EFMC)*, Bad Reichenhall, Germany, September 13-16, 2010

[34] Popp, A., Mayer, U.M., Wall, W.A. (2010): From 3D finite deformation dual mortar contact towards a fluid-structure-contact interaction method, **invited (minisymposium)**, *4th European Conference on Computational Mechanics (ECCM)*, Paris, France, May 16-21, 2010

[35] Popp, A., Gitterle, M., Gee, M.W., Wall, W.A. (2009): An efficient dual mortar approach for 3D finite deformation contact including frictional sliding, **contributed**, *1st International Conference on Computational Contact Mechanics (ICCCM)*, Lecce, Italy, September 16-18, 2009

[36] Popp, A., Gitterle, M., Gee, M.W., Wall, W.A. (2009): A mortar method for finite deformation frictional contact using a primal-dual active set strategy, **invited (minisymposium)**, *10th International Conference on Computational Plasticity (COMPLAS)*, Barcelona, Spain, September 2-4, 2009

[37] Popp, A., Gee, M.W., Wall, W.A. (2009): A primal-dual active set strategy for three-dimensional finite deformation mortar contact, **contributed**, *5th Contact Mechanics International Symposium (CMIS)*, Chania, Greece, April 28-30, 2009

[38] Popp, A., Zimmermann, M. (2007): Phenomenological modeling of a metallic honeycomb crash barrier, **contributed**, *2nd GACM Colloquium on Computational Mechanics*, Munich, Germany, October 10-12, 2007