Veit Gufler | Curriculum Vitæ

Free University of Bozen-Bolzano – *Via* Bruno Buozzi *Straße* 1
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Education and qualifications

Free University of Bozen-Bolzano **Bozen-Bolzano**
PhD in Advanced-Systems Engineering, with fellowship *May 5, 2023*
Dissertation: Design optimization of flexible multibody systems with analytical sensitivity analysis – An invariant-based approach to the direct differentiation of the floating frame of reference formulation

Free University of Bozen-Bolzano **Bozen-Bolzano**
Master in Industrial Mechanical Engineering, Mechanics and Automation *Oct. 1, 2019*
Master Thesis: Multibody dynamics and optimal design of a Tyrolean weir cleaning mechanism
Study Project: Mechanical vibration analysis with the open source FEM software Kratos Multiphysics
Final mark: 110/110 with honors

Free University of Bozen-Bolzano **Bozen-Bolzano**
Bachelor in Logistics and Production Engineering, Working Student *Mar. 22, 2016*
Bachelor Thesis: Study on design-to-manufacture and assembly of plastic components in the automotive industry

Gewerbeoberschule Max Valier **Bozen-Bolzano**
Technical high school (state exam), Mechanical Engineering *Jul. 3, 2010*
Final project: Design of Pelton turbines for small hydroelectric power plants

Professional experience in academia

Free University of Bozen-Bolzano **Bozen-Bolzano**
Research Assistant (Postdoctoral), Applied Mechanics *Mar. 2024 – Mar. 2025*
Kinematic and dynamic modeling of hybrid mobile robots, robot perception and motion planning & control, optimization of the systems and of the processes & tasks in industrial scenarios

Free University of Bozen-Bolzano **Bozen-Bolzano**
Research Assistant (Postdoctoral), Applied Mechanics *Nov. 2023 – Feb. 2024*
Modelling and simulation of multibody systems for digital twin solutions

Free University of Bozen-Bolzano **Bozen-Bolzano**
Research Assistant, Applied Mechanics *Nov. 2022 – Oct. 2023*
Study and development of digital models of mechatronic systems based on multibody modelling

Technical University of Munich **Garching near Munich**
Visiting Researcher, Chair of Applied Mechanics *Apr. – Jul. 2022*
Analytical derivatives of the floating frame of reference formulation for gradient-based design optimization of flexible multibody systems

Free University of Bozen-Bolzano **Bozen-Bolzano**
Doctoral researcher with fellowship, PhD in Advanced-Systems Engineering *Nov. 2019 – Oct. 2022*
Research topics: Flexible multibody dynamics, design optimization, sensitivity analysis, time integration, finite element method, mechanical vibrations, multi-physics

Professional experience in industry

Gufler Metall KG — **Moos-Moso in Pass.**
Design Engineer, Technical Office — *Oct. 2017 – Oct. 2019*
Design and engineering of metal structures

Röchling Autmomotive SRL — **Leifers-Laives**
Design Engineer, Department of Product Development — *Jan. 2012 – Sep. 2016*
Design of plastic components for the automotive industry including expansion tanks and SCR tanks

Röchling Autmomotive SRL — **Leifers-Laives**
Engineering Internship, Department of Product Development — *Summer 2011*
Elaboration of design guidelines for plastic products designed by Röchling Automotive

Gufler Metall KG — **Moos-Moso in Pass.**
Engineering Internships — *Summers 2007, 2008, 2009, 2010*
Design, production and installation of metal structures

Academic teaching experience

During the last years I had the possibility to gain teaching experiences for different courses as main lecturer, lecturer of course parts and modules as well as teaching assistent. For the future, I would like to further develop myself in this regard. My teaching interests include multibody simulation, structural dynamics, vibration theory, structural mechanics and numerical design optimization as well as related topics in mechanics and mechatronics.

Main lecturer

Mechatronics and Process Automation — **unibz**
Bachelor in Wood Engineering, Free University of Bozen-Bolzano — *2023/24*
Conception of course, lectures and recitations (6 credits)

Lecturer of course parts and modules

Dynamics of Mechanical Systems — **unibz**
Master in Industrial Mechanical Engineering, Free University of Bozen-Bolzano — *2023/24, 2024/25*
Lectures and recitations (8 hours)

Modeling and Simulation of Multibody Systems with Multiphysics Coupling — **unibz**
PhD in Advanced Systems Engineering, Free University of Bozen-Bolzano — *2023/24*
Lectures (6 hours)

Measurement and Numerical Modeling of Mechanical Systems — **unibz**
Bachelor in Industrial and Mechanical Engineering, Free University of Bozen-Bolzano — *2023/24*
Lectures and recitations (4 hours)

Mechanical Vibrations — **unibz**
Master in Industrial Mechanical Engineering, Free University of Bozen-Bolzano — *2021/22*
Lectures and recitations (12 hours)

Teaching Assistant

Mechatronics and Process Automation — **unibz**
Bachelor in Wood Engineering, Free University of Bozen-Bolzano — *2019/20, 2021/22*
Recitations & support (12 hours)

Structural Mechanics — **unibz**
Bachelor in Industrial and Mechanical Engineering, Free University of Bozen-Bolzano — *2017/18*
Recitations & support (30 hours)

Advised theses

Giani, L. (2025). "Constant tension control in ropeway systems and its effects on span oscillation dynamics". Advisors: R. Vidoni, V. Gufler. Bachelor Thesis. Free University of Bozen-Bolzano.

Berger, A. (2023). "Dynamic modelling and energy expenditure evaluation of closed-chain manipulators". Advisors: R. Vidoni, V. Gufler. Bachelor Thesis. Free University of Bozen-Bolzano.

Harich, V. (2020). "Structural analysis on wind turbine blades with open source software". Advisors: E. Wehrle, V. Gufler. Bachelor thesis. Free University of Bozen-Bolzano.

Rossi, L. (ongoing). "Design of highly uniform horns for ultrasonic vibration tools". Advisors: D. Richiedei, V. Gufler. Study Project. Free University of Bozen-Bolzano.

Skills

Expertise

Modelling:
- Flexible multibody dynamics
- Rigid multibody dynamics
- Structural dynamics
- Structural analysis
- Mechanical vibrations

Simulation:
- Transient analysis (time integration)
- Modal analysis
- Finite element analysis

Design Optimization:
- Gradient-based optimization
- Numerical sensitivity analysis
- Analytical sensitivity analysis
- Direct differentiation method

Computer skills

Programming: Python, Matlab

FEA: Kratos Multiphysics, Code_Aster

Multibody Dynamics: Adams, Exudyn

CAD: Catia V5, Solid Works, FreeCAD

Office: MS Office, LibreOffice, TEX and LYX

OS: Linux (Ubuntu), Windows

Languages

German: Native language

Italian: Fluent (C1 – Bilingual certificate of the Autonomous Province of Bozen-Bolzano)

English: Fluent (C1 – Language Center of the Free University of Bozen-Bolzano)

Practical skills

Working with tools and machines: Drilling, turning, milling, welding, etc.

Driving

Class B driver's licence

Awards and achievements

Silver Best Student Paper Award: 4th International Conference of IFToMM Italy – IFIT 2022

State exam for the qualification to the profession of engineers: University of Trento, Mechanical Engineering, Industrial Sector, Nov. 30, 2021

Affiliations

Chamber of engineers: Prov. Bozen-Bolzano, Industrial Engineer, Nr. 2293/A *Since Feb. 9, 2022*

ISSMO: International Society for Structural and Multidisciplinary Optimization *Since 2021*

Scientific activity and interests

My scientific interests include the fields of system modeling and simulation, as well as mechanical engineering design and numerical optimization of mechanical systems.

Modeling, simulation and optimization of rigid and flexible multibody systems

A main research topic focuses on the numerical design optimization of mechanical systems using gradient-based algorithms and analytical sensitivity analysis. This efficient optimization approach fosters the virtuous circle of lightweight design, enabling reductions in structural weight, energy consumption, and overall costs. Particular attention is paid to systems of structural and multibody dynamics. Related projects include LightOpt, doloMULTI and Re-Tipping, with supporting publications by Gufler et al. (submitted, 2023c, 2021b,e) and Wehrle et al. (2023). Potential future research topics include further developments towards large scale design optimization of flexible multibody systems leading to shape optimization and topology optimization. Furthermore, the combination of lightweight design and optimal control of flexible multibody systems is a promising research area.
Another main research topicFurther research focuses on transient analysis, which is essential for numerically capturing the time response of structural and multibody systems, and incorporates analytical sensitivity analysis. For numerically challenging systems such as structural and multibody dynamics, efficient computations and analytical sensitivity analysis are key factors to enhance system performance by identifying how variations in input parameters affect system behavior and enable efficient design optimization. This is achieved using a three-block solver scheme comprising governing equations, time integration and a nonlinear solver. Research projects include LightOpt and doloMULTI, supported with related publications by Gufler et al. (2023b, 2022b) and Wehrle and Gufler (2024, 2021).
Further research centers on the modeling and simulation of rigid and flexible multibody systems, as well as their integration within a multiphysical environment. The aim is to achieve realistic and precise representations of kinematic and dynamic systems including design sensitivities. Key objectives include enhancing numerical efficiency to streamline simulations without sacrificing accuracy. Possible future developments include model order reduction techniques to advance toward real-time applications and digital twins. This research is supported by the projects R3D, SMART-APP, GlobalWafers and Progress. Related publications include the ones by Gufler et al. (2024a,c, 2023a, 2022d, 2021a), Berger (2023), and Nezzi et al. (submitted).

Vibration reduction and control in mechanical systems

Additional research addresses the analysis and optimization of dynamic systems considering mechanical vibrations. Efforts include implementing measures to control or reduce vibrations, such as avoiding natural frequency ranges that could lead to resonance or the reduction of ropeway oscillations to enhance passenger safety and comfort. Key projects in this area include doloMULTI and Doppelmayr, with relevant publications by Giani (2025), Harich (2020), Rossi (ongoing), and Wehrle et al. (2020).

Collaborations with national and international research groups

There are collaborations with a number of research institutions, both at national and international level. A list of contacts is given below:
Dr.-Ing. Erich Wehrle: Collins Aerospace, Applied Research and Technology, Multidisciplinary Design Optimization Research Group, Germany

Prof. Renato Vidoni: University of Udine, Polytechnic Department of Engineering and Architecture, Italy

Dr. techn. Andreas Zwölfer: Technical University of Munich, TUM School of Engineering and Design, Chair of Applied Mechanics, Germany

Prof. Daniel Rixen: Technical University of Munich, TUM School of Engineering and Design, Chair of Applied Mechanics, Germany

Johannes Achleitner, M.Sc.: Technical University of Munich, TUM School of Engineering and Design, Chair of Aircraft Design, Germany

Fabian Sturm, M.Sc.: Technical University of Munich, TUM School of Engineering and Design, Chair of Aircraft Design, Germany

Prof. Johannes Gerstmayr: University of Innsbruck, Department of Mechatronics, Machine Elements and Design Engineering, Austria

Prof. Burkhard Corves: Rheinisch-Westfälische Technische Hochschule (RWTH) Aachen, Institute of Mechanism Theory, Machine Dynamics and Robotics, Germany

Prof. Mathias Hüsing: Rheinisch-Westfälische Technische Hochschule (RWTH) Aachen, Institute of Mechanism Theory, Machine Dynamics and Robotics, Germany

Prof. Dario Richiedei: University of Padova, Department of Management and Engineering, Italy

Prof. Ilaria Palomba: University of Padova, Department of Management and Engineering, Italy

Reviewer and organization activities

Reviewer for scientific journals

Actuators (MDPI, Switzerland), Applied Sciences (MDPI, Switzerland), Applied Mechanics (MDPI, Switzerland), Archive of Applied Mechanics (Springer, Germany), Computers and Structures (Elsevier, United Kingdom), Forschung im Ingenieurwesen/Engineering Research (Springer, Germany), International Journal of Mechanics and Control (Levrotto and Bella, Italy), Machines (MDPI, Switzerland), Materials (MDPI, Switzerland), Mechanical Sciences (Copernicus GmbH, Germany), Multibody System Dynamics (Springer, Netherlands), Sensors (MDPI, Switzerland)

Reviewer for conference proceedings

- 4th International Symposium on Industrial Engineering and Automation – ISIEA 2025
- 3rd International Symposium on Industrial Engineering and Automation – ISIEA 2024
- 5th International Conference of IFToMM Italy – IFIT 2024
- 3rd International Conference of IFToMM Italy – IFIT 2020

Organization activities

4th International Symposium on Industrial Engineering and Automation – ISIEA 2025:
- Member of the international scientific committee

3rd International Symposium on Industrial Engineering and Automation – ISIEA 2024:
- Session chair and co-organizer of special track (together with A. Zwölfer and J. Gerstmayr): Formulations and Applications of Structural and Multibody Dynamics
- Member of the international scientific committee
- Member of the organizing committee

ECCOMAS Thematic Conference on Multibody Dynamics 2021:
- Session chair of the 2nd session on flexible multibody dynamics

Research projects

Acronyms: PI ... principal investigator, TM ... team member.

International projects

R3D (TM) **Bozen-Bolzano**
Free University of Bozen-Bolzano, Faculty of Engineering *Mar. 2024 – Dec. 2026*
Redundancy for resilience in smart factories of the future through hybrid mobile robotic systems
In collaboration with Rheinisch-Westfälische Technische Hochschule (RWTH) Aachen
Funding: Joint project between Autonomous Province of Bozen-Bolzano and German Research Foundation – Deutsche Forschungsgemeinschaft (DFG)

Free University of Bozen-Bolzano internal projects

SMART-APP (TM) **Bozen-Bolzano**
Free University of Bozen-Bolzano, Faculty of Science and Technology *Nov. 2022 – Oct. 2023*
Automated Process Planning in Cyber Physical Production Systems of Smart Factories
In collaboration with Faculty of Computer Science at Free University of Bozen-Bolzano (unibz)

LightOpt (TM) **Bozen-Bolzano**
Free University of Bozen-Bolzano, Faculty of Science and Technology *Jul. 2020 – Dec. 2021*
Lightweight engineering of multibody systems with design optimization

doloMULTI (TM) **Bozen-Bolzano**
Free University of Bozen-Bolzano, Faculty of Science and Technology *Jan. 2018 – Dec. 2021*
Design Of Lightweight Optimized structures and systems under MULTIdisciplinary considerations through integration of MULTIbody dynamics in a MULTIphysics framework
In collaboration with Technical University of Munich (TUM), Polytechnic University of Catalonia (UPC), International Centre for Numerical Methods in Engineering (CIMNE)

Commissioned research and industry projects

Doppelmayr Seilbahnen GmbH (PI) **Austria**
Free University of Bozen-Bolzano, Faculty of Engineering *Jan. 2024 – Mar. 2025*
Mechanical solutions for providing constant tension to reduce span oscillations in ropeways (NDA-bound)

GlobalWafers MEMC Electronic Materials SpA (TM) **South Tyrol, Italy**
Free University of Bozen-Bolzano, Faculty of Engineering *Nov. 2023 – Oct. 2026*
Assisted systems-based solutions for high quality and sustainable monocrystalline silicon production

Progress Maschinen & Automation AG (TM) **South Tyrol, Italy**
Free University of Bozen-Bolzano, Faculty of Engineering *Nov. 2023 – Oct. 2025*
Digital Twin based kinematic and mechatronic modelling for testing and optimizing the performance and energy efficiency of machines

Re-Tipping (TM) **Bozen-Bolzano**
Free University of Bozen-Bolzano, Faculty of Science and Technology *May 2021 – Jan. 2022*
Tip Extender for wind turbines: vibrational, structural and fluid-dynamic monitoring and analysis
In collaboration with FRI-EL Green Power AG (Italy)

Software development

EasyBeam: Easy Application for Structural analYsis with BEAMs
https://github.com/veiguf/EasyBeam

SiMuLi: SImulation and sensitivity analysis for structural dynamics and MUltibody dynamics in LIghtweight engineering design
https://github.com/e-dub/SiMuLi

Patents

Kerschbaumer, D. and V. Gufler (Dec. 2023). "SCR-Tank mit abschnittsweise angefügter Entlüftungsleitung". German pat. DE 10 2016 202 310 B4.

Kerschbaumer, D. and V. Gufler (May 2020). "SCR tank with ventilation line attached in sections". U.S. pat. US 10 655 521 B2.

Kerschbaumer, D. and V. Gufler (Aug. 2017a). "SCR-Tank mit abschnittsweise angefügter Entlüftungsleitung". German pat. req. DE 10 2016 202 310 A1.

Kerschbaumer, D. and V. Gufler (Aug. 2017b). "SCR tank with ventilation line attached in sections". U.S. pat. req. US 2017/0234190 A1.

Journal publications

Wehrle, E. and V. Gufler (2024). "Analytical sensitivity analysis of dynamic problems with direct differentiation of generalized-α time integration". In: *Machines* 12.2, p. 128. DOI: 10.3390/machines12020128.

Gufler, V., E. Wehrle, J. Achleitner, and R. Vidoni (2023a). "A semi-analytical approach to sensitivity analysis with flexible multibody dynamics of a morphing forward wing section". In: *Multibody System Dynamics* 58.1, pp. 1–20. DOI: 10.1007/s11044-023-09886-9.

Gufler, V., E. Wehrle, and R. Vidoni (2023b). "Analytical sensitivity analysis of flexible multibody dynamics with index-1 differential-algebraic equations and Baumgarte stabilization". In: *International Journal of Mechanics and Control* 24.1, pp. 3–14.

Wehrle, E., V. Gufler, and F. Sturm (2023). "A gradient-based approach for optimal actuator design with morphing wings". In: *Optimization and Engineering* 25.2, pp. 1069–1104. DOI: 10.1007/s11081-023-09835-7.

Gufler, V., A. Zwölfer, and E. Wehrle (2022d). "Analytical derivatives of flexible multibody dynamics with the floating frame of reference formulation". In: *Multibody System Dynamics* 60.2, pp. 257–288. DOI: 10.1007/s11044-022-09858-5.

Gufler, V., E. Wehrle, and A. Zwölfer (2021e). "A review of flexible multibody dynamics for gradient-based design optimization". In: *Multibody System Dynamics* 53.4, pp. 379–409. DOI: 10.1007/s11044-021-09802-z.

Wehrle, E., V. Gufler, and R. Vidoni (2020). "Optimal in-operation redesign of mechanical systems considering vibrations – A new methodology based on frequency-band constraint formulation and efficient sensitivity analysis". In: *Machines* 8.1, p. 11. DOI: 10.3390/machines8010011.

Gufler, V., E. Wehrle, and R. Vidoni (submitted). "Mass matrix modeling approaches with flexible multibody dynamics: Consequences of consistent and lumped approaches for simulation, sensitivity analysis and design optimization". In: *N.A.*

Nezzi, C., V. Gufler, E. Rauch, and R. Vidoni (submitted). "A review of kinematic and dynamic modelling of mechanical systems towards digital twins". In: *N.A.*

Book chapters

Gufler, V., E. Wehrle, and R. Vidoni (2024a). "Use of lumped mass formulation in the design sensitivity analysis of flexible multibody dynamics". In: *Latest Advancements in Mechanical Engineering*. Vol. 1125. Lecture Notes in Networks and Systems. Springer, pp. 66–75. DOI: 10.1007/978-3-031-70465-9_8.

Gufler, V., E. Wehrle, and A. Zwölfer (2024c). "Direct differentiation of the floating frame of reference formulation via invariants for gradient-based design optimization". In: *Optimal Design and Control of Multibody Systems*. Vol. 42. IUTAM Bookseries. Springer, pp. 40–51. DOI: 10.1007/978-3-031-50000-8_4.

Gufler, V., E. Wehrle, and R. Vidoni (2022b). "Sensitivity analysis of flexible multibody dynamics with generalized-α time integration and Baumgarte stabilization". In: *Advances in Italian Mechanism Science*. Vol. 122. Mechanisms and Machine Science. Springer, pp. 147–155. DOI: 10.1007/978-3-031-10776-4_18.

Gufler, V., E. Wehrle, and R. Vidoni (2021b). "Multiphysical design optimization of multibody systems: Application to a Tyrolean weir cleaning mechanism". In: *Advances in Italian Mechanism Science*. Vol. 91. Mechanisms and Machine Science. Springer, pp. 459–467. DOI: 10.1007/978-3-030-55807-9_52.

Wehrle, E. and V. Gufler (2021). "Lightweight engineering design of nonlinear dynamic systems with gradient-based structural design optimization". In: *Proceedings of the Munich Symposium on Lightweight Design 2020*. Springer Berlin, pp. 44–57. DOI: 10.1007/978-3-662-63143-0_5.

Nezzi, C., V. Gufler, A. Berger, and R. Vidoni (accepted). "Energy expenditure comparison of planar robotic manipulators for pick-and-place operations". In: *IFToMM and Sustainable Development Goals*. Mechanisms and Machine Science. Springer.

Conference fullpaper proceedings

Gufler, V., E. Wehrle, and R. Vidoni (2023c). "Sensitivity analysis of flexible multibody dynamics applied to the gradient-based design optimization of a Tyrolean weir cleaning mechanism". In: *ECCOMAS Thematic Conference on Multibody Dynamics*. Jul. 24–28, 2023, Lisbon, Portugal.

Gufler, V., E. Wehrle, J. Achleitner, and R. Vidoni (2021a). "Flexible multibody dynamics and sensitivity analysis in the design of a morphing leading edge for high-performance sailplanes". In: *ECCOMAS Thematic Conference on Multibody Dynamics*. Dec. 12–15, 2021, Budapest, Hungary (online). DOI: 10.3311/ECCOMASMBD2021-203.

Conference abstracts or extended abstracts

Gufler, V., E. Wehrle, and R. Vidoni (2023c). "Sensitivity analysis of flexible multibody dynamics applied to the gradient-based design optimization of a Tyrolean weir cleaning mechanism". In: *ECCOMAS Thematic Conference on Multibody Dynamics*. Jul. 24–28, 2023, Lisbon, Portugal.

Gufler, V., E. Wehrle, and R. Vidoni (2022a). "Effiziente Sensitivitätsanalyse flexibler Mehrkörpersysteme für einen Kurbeltrieb mit 3D-Balkenelemente". In: *8. IFToMM D-A-CH Konferenz*. Feb. 24–25, 2022, Ilmenau, Germany (online). DOI: 10.17185/duepublico/75426.

Gufler, V., A. Zwölfer, and E. Wehrle (2022e). "Direct differentiation of the floating frame of reference formulation for gradient-based design optimization". In: *IUTAM Symposium on Optimal Design and Control of Multibody Systems*. Jul. 18–21, 2022, Hamburg, Germany.

Gufler, V., E. Wehrle, J. Achleitner, and R. Vidoni (2021a). "Flexible multibody dynamics and sensitivity analysis in the design of a morphing leading edge for high-performance sailplanes". In: *ECCOMAS Thematic Conference on Multibody Dynamics*. Dec. 12–15, 2021, Budapest, Hungary (online). DOI: 10.3311/ECCOMASMBD2021-203.

Gufler, V., E. Wehrle, and R. Vidoni (2021c). "Sensitivity analysis of a floating frame of reference approach to flexible multibody systems: Application to the design optimization of a Tyrolean weir cleaning mechanism". In: *14th World Congress of Structural and Multidisciplinary Optimization*. June 13–18, 2021, Boulder, Colorado, USA (online).

Gufler, V., E. Wehrle, and R. Vidoni (2021d). "Sensitivitätsanalyse flexibler Mehrkörpersysteme für die Unsicherheitsanalyse und Entwurfsoptimierung". In: *7. IFToMM D-A-CH Konferenz*. Feb. 18–19, 2021, Ilmenau, Germany (online). DOI: 10.17185/duepublico/74035.

Gufler, V., E. Wehrle, and R. Vidoni (2020a). "Mehrkörperdynamik und Entwurfsoptimierung unter Unsicherheit vom Rechenreinigungsmechanismus eines Tiroler Wehrs". In: *6. IFToMM D-A-CH Konferenz*. Feb. 27–28, 2020, Lienz, Austria. DOI: 10.17185/duepublico/71197.

Galli, D., C. Nezzi, V. Gufler, and R. Vidoni (accepted). "Comparative multibody study of spring isolation systems for vibrating screens". In: *ECCOMAS Thematic Conference on Multibody Dynamics*. Innsbruck, Austria.

Gufler, V., E. Wehrle, and A. Gufler (accepted). "Optimal design of a flushing gate with variable counterweight for self-actuating desanding systems". In: *ECCOMAS Thematic Conference on Multibody Dynamics*. Innsbruck, Austria.

Conference presentations

Gufler, V., E. Wehrle, and R. Vidoni (2024b). "Use of lumped mass formulation in the design sensitivity analysis of flexible multibody dynamics". In: *International Symposium on Industrial Engineering and Automation – ISIEA 2024*. Jun. 29–21, 2024, Bozen-Bolzano, Italy.

Gufler, V., E. Wehrle, and R. Vidoni (2023c). "Sensitivity analysis of flexible multibody dynamics applied to the gradient-based design optimization of a Tyrolean weir cleaning mechanism". In: *ECCOMAS Thematic Conference on Multibody Dynamics*. Jul. 24–28, 2023, Lisbon, Portugal.

Gufler, V., E. Wehrle, and R. Vidoni (2022a). "Effiziente Sensitivitätsanalyse flexibler Mehrkörpersysteme für einen Kurbeltrieb mit 3D-Balkenelemente". In: *8. IFToMM D-A-CH Konferenz*. Feb. 24–25, 2022, Ilmenau, Germany (online). DOI: 10.17185/duepublico/75426.

Gufler, V., E. Wehrle, and R. Vidoni (2022c). "Sensitivity analysis of flexible multibody dynamics with generalized-α time integration and Baumgarte stabilization". In: *4th International Conference of IFToMM Italy – IFIT 2022*. Sep. 7–9, 2022, Naples, Italy.

Gufler, V., A. Zwölfer, and E. Wehrle (2022e). "Direct differentiation of the floating frame of reference formulation for gradient-based design optimization". In: *IUTAM Symposium on Optimal Design and Control of Multibody Systems*. Jul. 18–21, 2022, Hamburg, Germany.

Gufler, V., E. Wehrle, J. Achleitner, and R. Vidoni (2021a). "Flexible multibody dynamics and sensitivity analysis in the design of a morphing leading edge for high-performance sailplanes". In: *ECCOMAS Thematic Conference on Multibody Dynamics*. Dec. 12–15, 2021, Budapest, Hungary (online). DOI: 10.3311/ECCOMASMBD2021-203.

Gufler, V., E. Wehrle, and R. Vidoni (2021c). "Sensitivity analysis of a floating frame of reference approach to flexible multibody systems: Application to the design optimization of a Tyrolean weir cleaning mechanism". In: *14th World Congress of Structural and Multidisciplinary Optimization*. June 13–18, 2021, Boulder, Colorado, USA (online).

Gufler, V., E. Wehrle, and R. Vidoni (2021d). "Sensitivitätsanalyse flexibler Mehrkörpersysteme für die Unsicherheitsanalyse und Entwurfsoptimierung". In: *7. IFToMM D-A-CH Konferenz*. Feb. 18–19, 2021, Ilmenau, Germany (online). DOI: 10.17185/duepublico/74035.

Gufler, V., E. Wehrle, and R. Vidoni (2020a). "Mehrkörperdynamik und Entwurfsoptimierung unter Unsicherheit vom Rechenreinigungsmechanismus eines Tiroler Wehrs". In: *6. IFToMM D-A-CH Konferenz*. Feb. 27–28, 2020, Lienz, Austria. DOI: 10.17185/duepublico/71197.

Gufler, V., E. Wehrle, and R. Vidoni (2020b). "Multiphysical design optimization of multibody systems: Application to a Tyrolean weir cleaning mechanism". In: *3rd International Conference of IFToMM Italy – IFIT 2020*. Sep. 9–10, 2020, Naples, Italy (online).

Other presentations

Gufler, V. (2022). "Sensitivity analysis of flexible multibody systems for efficient design optimization". In: *ECAM Spring 2022 – External Conference of the Chair of Applied Mechanics*. April, 20–22, 2022, Burghausen, Germany. Technical University of Munich.

Gufler, V. (2021). "Design optimization of rigid and flexible multibody systems". In: *1st Workshop on the use of Numerical Analysis in Engineering*. March 1, 2021, Bozen-Bolzano, Italy. Free University of Bozen-Bolzano.