

CURRICULUM VITAE

PERSONAL DATA

Name Markus Schöberl (Dipl.-Ing. Dr.techn)
Date of birth: 15.10.1978 in Salzburg
Citizenship: Austria
Marital status married to Tereza, Children: Nikolas and Tobias



ACADEMIC CAREER

10/2014 **Habilitation** in Control Systems Technology and Control Theory at the Johannes Kepler University Linz, defense: October 10th, 2014
05/2007 **Dissertation** (Ph.D) in Control theory (Dr.techn.) at the Johannes Kepler University Linz defense: May 16th, 2007
04/2004 **Diploma** (Dipl.-Ing.) in Mechatronics at the Johannes Kepler University Linz

EMPLOYMENT

since 10/2014 **Associate Professor** at the Institute of Automatic Control and Control Systems Technology, Johannes Kepler University Linz (JKU)
05/2014-09/2014 **University assistant** at the Institute of Automatic Control and Control Systems Technology, Johannes Kepler University Linz (JKU)
04/2011-04/2014 **Lecturer** at the Institute of Automatic Control and Control Systems Technology, Johannes Kepler University Linz (JKU) and **APART fellowship holder** of the Austrian Academy of Sciences
10/2007-03/2011 **University assistant** at the Institute of Automatic Control and Control Systems Technology, Johannes Kepler University Linz (JKU)
01/2007-09/2007 **Scientific research assistant** at the Institute of Automatic Control and Control Systems Technology, Johannes Kepler University Linz (JKU)

AWARDS AND FELLOWSHIPS

2004 **DOC Scholarship** of Austrian Academy of Sciences (12/2004 - 11/2006)
2007 **Fred Margulies Award** for dissertation
2011 **APART fellowship** of Austrian Academy of Sciences (04/2011 - 03/2014)

FWF PROJECTS

- 2017 **FWF Project** P-29964: System-theoretic Analysis and Controller Design for PDEs (05/2017 - 10/2021)
- 2019 **FWF Project** P-32151: Flatness based system decompositions (07/2019 - 06/2023)
- 2022 **FWF Project** P-36473: Flat Systems - Geometric Systems Theory and Applications (04/2023 - 03/2026)

PROFESSIONAL SERVICE

FURTHER SCIENTIFIC POSITIONS

- since 01/2018 **Area Coordinator** of the Area MECON in the LCM (Linz Center of Mechatronics) Competence Center of Symbiotic Mechatronics
- 07/2016-12/2017 **Area Coordinator** of the Area Mechanics and Model Based Control in LCM (Linz Center of Mechatronics)

INTERNATIONAL PROGRAM COMMITTEE AND CONFERENCE ORGANIZATION

1. 8th IFAC Workshop on Lagrangian and Hamiltonian Methods for Nonlinear Control, 2024
Associate Editor and **Member of the Program Committee**
2. 7th IFAC Workshop on Lagrangian and Hamiltonian Methods for Nonlinear Control, 2021
Associate Editor and **Member of the Program Committee**
3. 11th IFAC Symposium on Nonlinear Control Systems (NOLCOS), 2019
Associate Editor, NOC Co-Chair and **Organizer Invited Session:**
Geometric Methods in Nonlinear Control, together with Kurt Schlacher.
4. 3rd IFAC/IEEE CSS Workshop on Control of Systems Governed by Partial Differential Equations CPDE and XI Workshop Control of Distributed Parameter Systems, CDPS 2019
Associate Editor and **Member of the Program Committee**
5. 6th IFAC Workshop on Lagrangian and Hamiltonian Methods for Non Linear Control, 2018
Member of the Program Committee
6. 2nd IFAC Workshop on Control of Systems Governed by Partial Differential Equations, 2016
Member of the Program Committee
7. 5th IFAC Workshop on Lagrangian and Hamiltonian Methods for Non Linear Control, 2015
Associate Editor and **Member of the Program Committee**
8. 8th Vienna International Conference on Mathematical Modelling, 2015
Organizer Invited Session: Distributed parameter systems - new methods for modelling and control, together with Kurt Schlacher.
9. 21st International Symposium on Mathematical Theory of Networks and Systems (MTNS), 2014
Organizer Mini-Course: Geometric Structures for the Modelling, Analysis and Discretization of Infinite-Dimensional Port-Hamiltonian Systems, together with Alessandro Macchelli.

10. 21st International Symposium on Mathematical Theory of Networks and Systems (MTNS), 2014
Organizer Mini-Course: Stability and Stabilization of Distributed Port-Hamiltonian Systems, together with Alessandro Macchelli.
 11. 6th Vienna International Conference on Mathematical Modelling, Vienna, 2009
Organizer Invited Session: Modelling, Analysis and Control of Distributed Parameter Systems, together with Kurt Schlacher.
 12. 4th European Conference on Structural Control, St. Petersburg, 2008
Organizer Invited Session: Distributed Parameter Systems, Control Methods for Structures and Machines, together with Kurt Schlacher.
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PHD-COMMITTEE/ADVISOR

1. Carsten Knoll: Regelungstheoretische Analyse- und Entwurfsansätze für unteraktuierte mechanische Systeme, Technical University of Dresden, 2016
Referee and Examiner
 2. Bernd Kolar: Contributions to the Differential Geometric Analysis and Control of Flat Systems, Johannes Kepler University Linz (JKU), 2017
Examiner
 3. Hubert Rams: Contributions to the Analysis and Control for higher-order infinite-dimensional Systems, Johannes Kepler University Linz (JKU), 2018, *Award of Excellence for PhD-thesis*
Advisor, Referee and Examiner
 4. Tobias Malzer: Energy-Based Control and Observer Design of Infinite-Dimensional Port-Hamiltonian Systems, Johannes Kepler University Linz (JKU), 2021
Advisor, Referee and Examiner
 5. Conrad Gstöttner: Analysis and Control of Flat Systems by Geometric Methods, Johannes Kepler University Linz (JKU), 2022
Advisor, Referee and Examiner
 6. Johannes Diwold: Theory and Applications of Discrete-time Flatness, Johannes Kepler University Linz (JKU), 2023
Advisor, Referee and Examiner
 7. Klemens Fritzsche: Algebraische Flachheitsanalyse nichtlinearer Systeme, Technical University of Dresden, 2023
Referee and Examiner
-

HABILITATION-COMMITTEE

1. Wolfgang Gruber, Bearingless Slice Motor Systems without Permanent Magnetic Rotors, Johannes Kepler University Linz (JKU), 2018
Examiner
2. Alexander Humer, Contributions to Non-linear Problems in Structural Mechanics and Smart Structures, Johannes Kepler University Linz (JKU), 2020
Examiner

REFEREEING ACTIVITIES (JOURNALS)

- Automatica
- IEEE Transactions on Automatic Control
- Systems & Control Letters
- European Journal of Control
- SIAM Journal on Control and Optimization
- International Journal of Control
- IMA Journal of Mathematical Control and Information
- International Journal of Robust and Nonlinear Control
- Acta Mechanica
- Applied Mathematical Modelling
- Mathematical and Computer Modelling of Dynamical Systems
- Journal of Mathematical Analysis and Applications
- Control Engineering Practice
- International Journal of Circuit Theory and Applications
- Mechatronics
- at-automatisierungstechnik
- Journal of Systems and Control Engineering
- IET Control Theory & Applications
- Mechanical Sciences
- International Journal of Systems Science.

TEACHING

JKU-LINZ

- Courses: Control Systems, Advanced Frequency-Domain Methods (Control System Technology 1), Advanced State-Space Methods (Control System Technology 2), Selected Topics in Control Theory, Geometric Methods in Control Theory, Control Theory for Nonlinear Systems
- Review Courses: Linear Algebra for Automatic Control, Mathematical foundations for Automatic Control 2
- Seminars: Seminar on Control Theory

Exercises:	Automatic Control 1, Automatic Control 2, Nonlinear Control of Mechatronic Systems, Modern Frequency Domain Methods in Control
Practicals:	Practical Training in Automatic Control, Control System Technology 1, Control System Technology 2

DIPLOMA(MASTER) THESIS CO-ADVISOR

2008	Siuka Andreas: Analysis and Control of Underactuated Mechanical Systems by Energy Shaping Methods
2009	Lederhilger Martin: Modellbildung und Analyse des Verdampfungskühlsystems eines Hubbalkenofens
2009	Angerer Alfred: Modellbildung und Steuerung der Kühlstrecke des Warmwalzsimulators
2011	Grießler Leopold: Fahrstrategieoptimierung bei Nutzfahrzeugen mit Hilfe vorausschauender Informationen
2011	Hofmair Matthias: Analyse der Wirkkette Funktionale Reifeneigenschaften - Fahrdynamik Gesamtfahrzeug
2011	Almer Daniel: Modellbasierte Temperaturregelung für einen Glühsimulator
2014	Rams Hubert: Analyse und Regelung verteilt-parametrischer Systeme

MASTER THESIS ADVISOR

2016	Hinterbichler Christoph: Studie zur Anwendbarkeit regelungstechnischer Methoden in der Digitalhydraulik
2017	Speletz Richard: Vorsteuerentwurf und Trajektorienfolgeregelung am Labormodell Wagen mit Einfachpendel
2017	Malzer Tobias: Energy based Control and Swing Up of the Furuta Pendulum
2018	Diwold Johannes: Beobachterentwurf für nichtlineare mechanische Systeme
2019	Treml Paul: Zeitoptimale Trajektorienplanung für einen flexiblen Ausleger
2019	Gstöttner Conrad: Beispiele zur Berechnung flacher Ausgänge nichtlinearer Systeme mit geometrischen Methoden
2019	Roithinger Philipp: Neue Mess- und Regelungskonzepte für den Leistungspfad einer Schweißstromquelle
2020	Wagner Matthias: On the simulation of stochastic differential equations with applications in mechatronical engineering
2020	Ecker Lukas: Symplektische Integration finit- und infinit-dimensionaler Hamiltonscher Systeme
2020	Gnad Daniel: Energy based Control of Stochastic Systems

2020	Galli Lukas: Flachheitsbasierte Trajektorienfolgeregelung eines Helikoptermodells
2020	Gierlinger Jochen: Klassische und moderne Methoden der robusten Regelung
2021	Peham Sandro: Immersion und Invarianz Reglerentwurf für nichtlineare Systeme
2021	Zauner Klaus: Experimentelle Untersuchungen zur Anwendbarkeit zeitdiskreter flachheitsbasierter Trajektorienfolgeregelungen
2021	Rittel Felix: Load Reduction of a Multi-Wind Turbine using a Gain-Scheduled LQR Controller
2022	Hackl Dominik: Computerunterstützte Methoden zur Analyse der Flachheit von nicht-linearen dynamischen Systemen
2022	Manuel Banzirsch: Modellbildung und Reglerentwurf eines direkt angetriebenen Servoventils
2023	Georg Hartl: Flatness-Based Tracking Control Using Quasi-Static Feedback of Generalized and Classical States
2023	Johannes Schrotshamer: Zeitdiskrete, flachheitsbasierte Steuerung und Regelung eines Regalbediengerätes
2023	Johannes Reindl: Steuerung eines Baggerarms mit unabhängig aufgelösten Steuerkanälen
2024	Michael Gattringer: Control of discrete-time Port-Hamiltonian Systems
2024	David Mühlberger: Modell-basierte Regelung der Temperatur eines verzinkten Bandes mit Kühlturm & Water-Quench

PUBLICATIONS

JOURNAL ARTICLES

1. B. Kolar, J. Diwold, C. Gstöttner, M. Schöberl, On the Exact Linearization and Control of Flat Discrete-time Systems, *International Journal of Control*, 97(3), pp. 412-426, 2024.
2. L. Ecker, M. Schöberl, Indirect data-driven observer design using neural canonical observer structures, *IEEE Control Systems Letters*, vol 7, pp- 1706 - 1711, 2023.
3. C. Gstöttner, B. Kolar, M. Schöberl, A Flat System Possessing no (x,u)-Flat Output, *IEEE Control Systems Letters*, vol 7, pp. 1033-1038, 2023.
4. C. Gstöttner, B. Kolar, M. Schöberl, Necessary and Sufficient Conditions for the Linearisability of Two-Input Systems by a Two-Dimensional Endogenous Dynamic Feedback, *International Journal of Control*, 96(3), pp. 800-821, 2023.
5. B. Kolar, J. Diwold, M. Schöberl, Necessary and Sufficient Conditions for Difference Flatness, *Transactions on Automatic Control*, 68(3), pp. 1715-1721, 2023.
6. J. Diwold, B. Kolar, M. Schöberl, Discrete-time Flatness-based Control of a Gantry Crane, *Control Engineering Practice*, vol 119, 2022.

7. J. Diwold, B. Kolar, M. Schöberl, A Trajectory-Based Approach to Discrete-Time Flatness, *IEEE Control Systems Letters*, vol 6, pp. 289-294, 2022.
8. C. Gstöttner, B. Kolar, M. Schöberl, A Structurally Flat Triangular Form Based on the Extended Chained Form, *International Journal of Control*, 95(5), pp. 1144-1163, 2022.
9. B. Kolar, M. Schöberl, J. Diwold, Differential-Geometric Decomposition of Flat Nonlinear Discrete-Time Systems, *Automatica*, 132, pp. 109828, 2021.
10. T. Malzer, H. Rams, B. Kolar, M. Schöberl, Stability Analysis of the Observer Error of an In-Domain Actuated Vibrating String, *IEEE Control Systems Letters*, 5(4), pp. 1237 - 1242, 2021.
11. J. Diwold, B. Kolar, M. Schöberl, A Normal Form for Two-Input Flat Nonlinear Discrete-Time Systems, *International Journal of Systems Science*, 52(8), pp. 1586-1598, 2021.
12. L. Ecker, T. Malzer, A. Wahrburg, M. Schöberl, Observer Design for a Single Mast Stacker Crane, *at-Automatisierungstechnik*, 69(9), pp. 806-816, 2021.
13. T. Malzer, H. Rams, M. Schöberl, On Structural Invariants in the Energy-Based In-Domain Control of Infinite-Dimensional Port-Hamiltonian Systems, *Systems & Control Letters, Volume 145*, 2020.
14. H. Kogler, M. Schöberl, R. Scheidl, Passivity-based control of a pulse-width mode operated digital hydraulic drive, *Proceedings of the Institution of Mechanical Engineers, Part I: Journal of Systems and Control Engineering*, 233(6), pp. 656-665, 2019.
15. M. Schöberl, K. Schlacher, On the extraction of the boundary conditions and the boundary ports in second-order field theories, *Journal of Mathematical Physics*, 59(10), pp. 102902 1-13, 2018.
16. H. Rams, M. Schöberl, K. Schlacher, Optimal Motion Planning and Energy-based Control of a Single Mast Stacker Crane, *Transactions on Control Systems Technology*, 26(4), pp. 1449-1457, 2018.
17. M. Schöberl, K. Schlacher, Lagrangian and hamiltonian formulation for infinite-dimensional systems - a variational point of view. *Mathematical and Computer Modelling of Dynamical Systems*, 23(1), pp. 89-103, 2017.
18. M. Schöberl, K. Schlacher, On an implicit triangular decomposition of nonlinear control systems that are 1-flat - a constructive approach, *Automatica*, 50(6), pp. 1649-1655, 2014.
19. M. Schöberl, A. Siuka, Jet bundle formulation of infinite-dimensional port-Hamiltonian systems using differential operators, *Automatica*, 50(2), pp. 607-613, 2014.
20. M. Schöberl, A. Siuka, On Casimir Functionals for infinite-dimensional Port-Hamiltonian Control Systems, *IEEE Transactions on Automatic Control*, 58(7), pp. 1823-1828, 2013.
21. M. Schöberl, K. Schlacher, On an intrinsic formulation of time-variant Port Hamiltonian systems, *Automatica*, 48(9), pp. 2194-2200, 2012.
22. A. Siuka, M. Schöberl, K. Schlacher, Port-Hamiltonian Modelling and Energy based Control of the Timoshenko Beam, *Acta Mechanica* 222(1-2), pp. 69-89, 2011.
23. M. Schöberl, K. Schlacher, First order Hamiltonian Field Theory and Mechanics, *Mathematical and Computer Modelling of Dynamical Systems*, 17(1) Taylor & Francis, pp. 105-121, 2011.
24. A. Siuka, M. Schöberl, Applications of energy based control methods for the inverted pendulum on a cart, *Robotics and Autonomous Systems*, 57(10), pp. 1012-1017, 2009.

25. M. Schöberl, H. Ennsbrunner, K. Schlacher, Modelling of piezoelectric structures - a Hamiltonian approach, *Mathematical and Computer Modelling of Dynamical Systems*, 14(3), Taylor & Francis, pp. 179-193, 2008.
26. M. Fliess, S. Fuchshumer, M. Schöberl, K. Schlacher, H. Sira-Ramirez, An Introduction to Algebraic Discrete-Time Linear Parametric Identification with a Concrete Application, *Journal Européen des Systèmes Automatisés*, 42(2-3), pp. 211-232, 2008.
27. M. Schöberl, K. Schlacher, Covariant formulation of the governing equations of continuum mechanics in an Eulerian description, *Journal of Mathematical Physics*, 48(5), pp. 052902-1–052902-15, 2007.

JOURNAL ARTICLES (IN GERMAN)

1. B. Kolar, J. Diwold, M. Schöberl: Zur Theorie und Anwendung der Flachheit nichtlinearer zeitdiskreter Systeme, *at-Automatisierungstechnik* 69(7), pp. 574-584, 2021
2. H. Rams, M. Schöberl, Energiebasierte Regelung von verteilt-parametrischen Hamiltonschen Systemen mit Hamiltonschen Dichten zweiter Ordnung, *at-Automatisierungstechnik*, 65(5), pp. 323-336 , 2017.
3. B. Kolar, M. Schöberl, K. Schlacher, Eine Normalform für eine spezielle Klasse flacher nichtlinearer zeitdiskreter Mehrgrößensysteme, *at-Automatisierungstechnik*, 64(8), pp. 586-601, 2016.
4. M. Schöberl, Differentialgeometrische Beschreibung und Analyse Tor-basierter Hamilton'scher Systeme, *at-Automatisierungstechnik*, 63(9), pp. 672-683, 2015.
5. M. Schöberl, K. Schlacher, Lagrange'sche und Hamilton'sche Beschreibung partieller Differentialgleichungen, *at-Automatisierungstechnik*, 63(8), pp. 570-583 , 2015.
6. M. Schöberl, K. Schlacher, Eine Normalform für eine spezielle Klasse flacher nichtlinearer Mehrgrößensysteme in Pfaffscher Systemdarstellung, *at-Automatisierungstechnik*, 62(7), pp. 463-474, 2014.
7. K. Schlacher, M. Schöberl, Geometrische Darstellung nichtlinearer Systeme, *at-Automatisierungstechnik*, 62(7), pp. 452-462, 2014.
8. M. Schöberl, K. Schlacher, Zur konstruktiven Berechnung flacher Ausgänge für nichtlineare Systeme, *at-Automatisierungstechnik*, 60(8), pp. 452-461, 2012.
9. A. Siuka, M. Schöberl, K. Rieger, K. Schlacher, Regelung verteilt-parametrischer Hamiltonscher Systeme auf Basis struktureller Invarianten, *at-Automatisierungstechnik* 59(8), pp. 465-478, 2011.

BOOKS

1. Contributions to the Analysis of Structural Properties of Dynamical Systems in Control and Systems Theory - A Geometric Approach, in *Modellierung und Regelung komplexer dynamischer Systeme*: Shaker Verlag, Aachen, 2014, ISBN: 978-3-84402-9673
2. Geometry and Control of Mechanical Systems: An Eulerian, Lagrangian and Hamiltonian Approach, in *Modellierung und Regelung komplexer dynamischer Systeme*: Shaker Verlag, Aachen, 2008, ISBN: 978-3-8322-7240-1.

BOOK CHAPTERS

1. B. Kolar, N. Gehring, M. Schöberl: On the Calculation of Differential Parametrizations for the Feedforward Control of an Euler-Bernoulli Beam, *Dynamics and Control of Advanced Structures and Machines*, Advanced Structured Materials, vol 156, pp. 123-136, Springer 2022, ISBN: 978-3-030-79324-1.
2. H. Rams, M. Schöberl, K. Schlacher, Control of Beam Vibrations by Casimir Functions, *Dynamics and Control of Advanced Structures and Machines*, Springer International Publishing, pp. 137-145, 2019, ISBN: 978-3-319-90884-7.
3. M. Schöberl, K. Schlacher, Variational Principles for Different Representations of Lagrangian and Hamiltonian Systems, *Dynamics and Control of Advanced Structures and Machines*, Springer International Publishing, pp. 65-73, 2017, ISBN: 978-3-319-43079-9.
4. M. Schöberl, K. Schlacher, On Geometric Properties of Triangularizations for Nonlinear Control Systems, *Mathematical Control Theory I*, Lecture Notes in Control and Information Sciences, Vol. 461, Springer International Publishing, pp. 237-255, 2015, ISBN: 978-3-319-20987-6.
5. K. Schlacher, M. Schöberl, Observability and Reachability, a Geometric Point of View, *Mechanics and Model-Based Control of Advanced Engineering Systems*, pp 265-273, 2014, Springer, ISBN 978-3-7091-1570-1.
6. M. Schöberl, A. Siuka, Modelling and Control of infinite-dimensional Mechanical Systems - A port-Hamiltonian Approach, *Multibody Systems Dynamics, Robotics and Control*, pp. 75-94, 2013, Springer, ISBN: 978-3709112885.
7. K. Schlacher, M. Schöberl, M. Staudecker, Flatness Based Control of Linear and Nonlinear Systems, *Advanced Dynamics and Model-Based Control of Structures and Machines*, pp. 195-203, 2011, Springer, ISBN: 978-3-7091-0796-6.

CONFERENCE PROCEEDINGS

1. B. Kolar, J. Diwold, C. Gstöttner, M. Schöberl, Discrete-time Flatness and Linearization along Trajectories, *22nd IFAC World Congress*, IFAC-PapersOnLine 56(2), pp. 2877-2882, Yokohama, 2023.
2. L. Ecker, M. Schöberl, Data-driven control and transfer learning using neural canonical control structures, *9th International Conference on Control, Decision and Information Technologies (CoDIT)*, pp. 1856-1861, Rome, 2023..
3. J. Diwold, B. Kolar, M. Schöberl, Flatness Analysis for the Sampled-data Model of a Single Mast Stacker Crane, *12th IFAC Symposium on Nonlinear Control Systems*, IFAC-PapersOnLine 56(1), pp. 222-227, Canberra, 2023.
4. J. Diwold, B. Kolar, M. Schöberl, Discrete-time Flatness-based Controller Design using an Implicit Euler-discretization, *12th IFAC Symposium on Nonlinear Control Systems*, IFAC-PapersOnLine 56(1), pp. 138-143, Canberra, 2023.
5. L. Ecker, M. Schöberl, A Data-Driven Approach for the Identification of Nonlinear State-Dependent Switched Systems Using Expectation-Maximization, *17th International Conference on Control, Automation, Robotics and Vision (ICARCV)*, pp. 361-366, Singapore, 2022.

6. L. Ecker, M. Schöberl, Data-Driven Observer Design for an Inertia Wheel Pendulum with Static Friction, *1st IFAC Workshop on Control of Complex Systems (COSY)*, IFAC-PapersOnLine 55(40), pp. 193-198, Bologna, 2022.
7. L. Ecker, K. Schlacher, M. Schöberl, Observer Design for an Inertia Wheel Pendulum with Static Friction, *10th Vienna International Conference on Mathematical Modelling (MATHMOD)*, IFAC-PapersOnLine 55(20), pp. 313-318, 2022.
8. T. Malzer, L. Ecker, M. Schöberl, Energy-based Control and Observer Design for higher-order infinite-dimensional Port-Hamiltonian Systems, 7th IFAC Workshop on Lagrangian and Hamiltonian Methods for Nonlinear Control, IFAC-PapersOnLine, 54(19), pp. 44-51, Berlin, 2021.
9. C. Gstöttner, B. Kolar, M. Schöberl, A Finite Test for the Linearizability of Two-Input Systems by a Two-Dimensional Endogenous Dynamic Feedback, *European Control Conference (ECC)*, pp. 970-977, 2021.
10. T. Malzer, J. Toledo, Y. Le Gorrec, M. Schöberl, Energy-Based In-Domain Control and Observer Design for Infinite-Dimensional Port-Hamiltonian Systems, *24th International Symposium on Mathematical Theory of Networks and Systems (MTNS)*, IFAC-PapersOnLine 54(9), pp. 368-375, 2021.
11. B. Kolar, M. Schöberl, Linearized Controllability Analysis of Semilinear Partial Differential Equations, *24th International Symposium on Mathematical Theory of Networks and Systems (MTNS)*, IFAC-PapersOnLine 54(9), pp. 347-352, 2021.
12. C. Gstöttner, B. Kolar, M. Schöberl, On a Flat Triangular Form Based on the Extended Chained Form, *24th International Symposium on Mathematical Theory of Networks and Systems (MTNS)*, IFAC-PapersOnLine 54(9), pp. 245-252, 2021.
13. C. Gstöttner, B. Kolar, M. Schöberl, On the Linearization of Flat Two-Input Systems by Prolongations and Applications to Control Design, *21st IFAC World Congress*, Berlin (virtual), IFAC-PapersOnline 53(2), pp. 5479-5486, 2020.
14. B. Kolar, M. Schöberl, System-theoretic Analysis of Nonlinear Infinite-dimensional Systems with Generalized Symmetries, *11th IFAC Symposium on Nonlinear Control Systems (NOLCOS)*, Vienna, pp. 438-439 (short paper), 2019.
15. T. Malzer, H. Rams, M. Schöberl, Energy-Based In-Domain Control of a Piezo-Actuated Euler-Bernoulli Beam, *3rd IFAC/IEEE CSS Workshop on Control of Systems Governed by Partial Differential Equations and XI Workshop Control of Distributed Parameter Systems*, Oaxaca, Mexico, pp. 147-152, 2019.
16. T. Malzer, H. Rams, M. Schöberl, Energy-Based Control of Nonlinear Infinite-Dimensional Port-Hamiltonian Systems with Dissipation, *Proceedings of the 57th IEEE Conference on Decision and Control (CDC)*, Miami, USA, pp. 3746-3751, 2018.
17. B. Kolar, M. Schöberl, Symmetry Groups and the Observability of PDEs, *Proceedings in Applied Mathematics and Mechanics (PAMM)*, Volume 18, Issue 1, 2018.
18. B. Kolar, H. Rams, M. Schöberl, Application of Symmetry Groups to the Observability Analysis of Partial Differential Equations, *23rd International Symposium on Mathematical Theory of Networks & Systems (MTNS)*, Hong Kong, pp. 247-254, 2018.
19. H. Rams, M. Schöberl, On Structural Invariants in the Energy Based Control of Port-Hamiltonian Systems with Second-Order Hamiltonian, *American Control Conference (ACC)*, Seattle, pp. 1139-1144, 2017.

20. B. Kolar, A. Kaldmäe, M. Schöberl, Ü. Kotta, K. Schlacher, Construction of Flat Outputs of Nonlinear Discrete-Time Systems in a Geometric and an Algebraic Framework, *10th IFAC Symposium on Nonlinear Control Systems (NOLCOS)*, Monterey, CA, USA, pp. 808-813, 2016.
21. B. Kolar, M. Schöberl, K. Schlacher, Properties of Flat Systems with regard to the Parameterization of the System Variables by the Flat Output, *10th IFAC Symposium on Nonlinear Control Systems (NOLCOS)*, Monterey, CA, USA, pp. 826-831, 2016.
22. H. Rams, M. Schöberl, K. Schlacher, Local Decomposition and Accessibility of Nonlinear Infinite-Dimensional Systems, *2nd IFAC Workshop on Control of Systems Governed by Partial Differential Equations (CPDE)*, Bertinoro, Italy, pp. 170-175, 2016.
23. B. Kolar, M. Schöberl, K. Schlacher, A Decomposition Procedure for the Construction of Flat Outputs of Discrete-Time Nonlinear Control Systems, *22nd International Symposium on Mathematical Theory of Networks & Systems (MTNS)*, Minneapolis, MN, USA, pp. 775-782, 2016.
24. M. Schöberl, K. Schlacher, Port-Hamiltonian representation for pdes with second-order derivatives in the energy density, *Proceedings in Applied Mathematics and Mechanics (PAMM)*, Volume 16, Number 1, pp. 19-22, 2016.
25. H. Rams, M. Schöberl, K. Schlacher, Local Decompositions of Second Order Infinite-Dimensional Systems, *Proceedings in Applied Mathematics and Mechanics (PAMM)*, Volume 16, Number 1, pp. 825-826, 2016.
26. B. Kolar, M. Schöberl, K. Schlacher, Some Remarks concerning Flatness and the Parameterization of the System Variables by a Flat Output, *Proceedings in Applied Mathematics and Mechanics (PAMM)*, Volume 16, Number 1, pp. 811-812, 2016.
27. R. Haas, C. Hinterbichler, E. Lukachev, M. Schöberl, Optimal Digital Hydraulic Feed-Forward Control Applied to Simple Cylinder Drives, *Proceedings of the Eight Workshop on Digital Fluid Power Tampere*, Finland, 2016.
28. M. Schöberl, K. Schlacher, Port-Hamiltonian formulation for Higher-order PDEs, *5th IFAC Workshop on Lagrangian and Hamiltonian Methods for Non Linear Control*, Lyon, France, 2015, IFAC-PapersOnLine, Volume 48, Issue 13, pp. 244-249.
29. B. Kolar, M. Schöberl, K. Schlacher, Remarks on a Triangular Form for 1-Flat Pfaffian Systems with Two Inputs, *1st IFAC Conference on Modelling, Identification and Control of Nonlinear Systems (MICNON)*, Saint Petersburg, Russia, 2015, IFAC-PapersOnLine, Volume 48, Issue 11, pp. 109-114.
30. K. Schlacher, M. Schöberl, B. Kolar, A Jet Space Approach to Derive Flat Outputs, *1st IFAC Conference on Modelling, Identification and Control of Nonlinear Systems (MICNON)*, Saint Petersburg, Russia, 2015, IFAC-PapersOnLine, Volume 48, Issue 11, pp. 131-136.
31. M. Schöberl, K. Schlacher, Lagrangian and Port-Hamiltonian formulation for Distributed-parameter systems, *8th Vienna Symposium on Mathematical Modelling (MATHMOD)*, Vienna, Austria, 2015, IFAC-PapersOnLine, Volume 48, Issue 1, pp. 610-615.
32. K. Schlacher, M. Schöberl, A Jet Space Approach to Check Pfaffian Systems for Flatness, *52nd IEEE Conference on Decision and Control (CDC)*, Florence, Italy, pp. 2576-2581, 2013.
33. M. Schöberl, A. Siuka, Analysis and Comparison of Port-Hamiltonian Formulations for Field Theories - demonstrated by means of the Mindlin plate, *European Control Conference (ECC)*, Zürich, Switzerland, pp. 548-553, 2013.

34. M. Schöberl, A. Siuka, On the port-Hamiltonian representation of systems described by partial differential equations, *4th IFAC Workshop on Lagrangian and Hamiltonian Methods for Non Linear Control*, Bertinoro, Italy, pp. 1-6, 2012.
35. M. Schöberl, K. Schlacher, On calculating flat outputs for Pfaffian systems by a reduction procedure - demonstrated by means of the VTOL example, *9th IEEE International Conference on Control & Automation*, ICCA'11, Santiago, Chile, pp. 477-482, 2011.
36. M. Schöberl, A. Siuka, On Casimir Functionals for Field Theories in Port-Hamiltonian Description for Control Purposes, *50th IEEE Conference on Decision and Control (CDC)*, Orlando, pp. 7759-7764, 2011.
37. K. Rieger, M. Schöberl, K. Schlacher, Local Decomposition and Accessibility of PDE Systems, *49th IEEE Conference on Decision and Control (CDC)*, Atlanta, pp. 6271-6276, 2010.
38. M. Schöberl, A. Siuka, K. Schlacher, Geometric Aspects of First Order Field Theories in Piezoelectricity and Magnetohydrodynamics, *International Conference on Electromagnetics in Advanced Applications*, Sydney (ICEAA), IEEE xplore pp. 55-58, 2010.
39. H. Seyrkammer, D. Almer, S. Fuchshumer, K. Rieger, M. Schöberl, K. Schlacher, Flatness-based Temperature Control of Metal Sheets, *Proceedings 5th IFAC Symposium on Mechatronic Systems*, pp 8-15, 2010.
40. M. Schöberl, K. Schlacher, On parametrizations for a special class of nonlinear systems, *IFAC Symposium on Nonlinear Control Systems (NOLCOS)*, pp. 1261-1266, Bologna, 2010.
41. K. Weichinger, S. Fuchshumer, K. Schlacher, M. Schöberl, Modeling, analysis and control of coupled elastic structures with the focus on vibration attenuation, *5th World Conference on Structural Control and Monitoring (WCSCM)*, Tokyo, 2010.
42. M. Schöberl, K. Rieger, K. Schlacher, System parametrization using affine derivative systems, *19th International Symposium on Mathematical Theory of Networks & Systems (MTNS)*, pp. 1737-1743, Budapest, 2010.
43. A. Siuka, M. Schöberl, K. Schlacher, Hamiltonian Evolution Equations of inductionless Magnetohydrodynamics, *19th International Symposium on Mathematical Theory of Networks & Systems (MTNS)*, pp. 1889-1896, Budapest, 2010.
44. M. Schöberl, K. Schlacher, Some remarks on affine derivative systems concerning flatness, *Proceedings in Applied Mathematics and Mechanics* 10(1), pp. 631-632, 2010.
45. M. Schöberl, K. Schlacher, Hamiltonian Field Theory and Mechanics, *Proceedings of the 6th Vienna International Conference on Mathematical Modelling (MATHMOD)*, pp. 950-957, 2009.
46. M. Schöberl, Some aspects of differential geometry in mechanics and electromagnetism, *Proceedings of the Workshop on Advanced Computational Electromagnetics*, pp. 267-287, Rome, 2009.
47. M. Schöberl, K. Schlacher, A Geometric Description Of Particle Mechanics Including Electromagnetism, *Proceedings of the 18th International Symposium on Mathematical Theory of Networks & Systems (MTNS)*, Blacksburg, 2008.
48. A. Siuka, M. Schöberl, Applications of Energy based Control Methods for the Inverted Pendulum on a Cart, Preprint-Proceedings 5th International Conference on Computational Intelligence, Robotics and Autonomous Systems (CIRAS), pp. 187-192, Linz, 2008.

49. M. Schöberl, K. Schlacher, Classical mechanics and electromagnetism - A covariant view, *CD-ROM Proceedings of the XXII International Congress of Theoretical and Applied Mechanics (ICTAM)*, Adelaide, 2008.
50. K. Schlacher, M. Schöberl, T. Rittenschober, Model based Control of Structures and Machines, a Dissipative and Internal Model based Approach, *4th European Conference on Structural Control (ECSC)*, Vol. 2, pp. 687-694, St. Petersburg, 2008.
51. M. Schöberl, Time Variant Hamiltonian Control Systems - A Covariant Approach, *Proceedings in Applied Mathematics and Mechanics*, 7(1), pp. 3030007-3030008, 2008.
52. K. Rieger, K. Schlacher, M. Schöberl, On the Accessibility of Distributed Parameter Systems, *Proceedings of the 17th World Congress IFAC*, Seoul, Korea, pp. 7743-7748, 2008.
53. R. Stadlmayr, M. Schöberl, K. Schlacher, A Combination of Feedforward and Feedback for the Control of the nonlinear Benchmark Inertia Wheel Pendulum, *Conference Proceedings European Control Conference 2007 (ECC)*, pp. 5802-5808, 2007.
54. K. Schlacher, M. Schöberl, Construction of Flat Outputs By Reduction and Elimination, *CD Proceedings IFAC Symposium on Nonlinear Control Systems (NOLCOS)*, Pretoria, pp. 666-671, 2007.
55. K. Schlacher, M. Schöberl, Die Konstruktion flacher Ausgänge durch sukzessive Elimination und Reduktion, *Tagungsband 15. Steirisches Seminar über Regelungstechnik und Prozessautomatisierung*, in Institut für Regelungs- und Automatisierungstechnik, TU Graz, pp. 165-170, 2007.
56. M. Schöberl, R. Stadlmayr, K. Schlacher, Geometric Analysis of Time Variant Hamiltonian Control Systems, *CD Proceedings IFAC Symposium on Nonlinear Control Systems (NOLCOS)*, Pretoria, pp. 1026-1031, 2007.
57. M. Schöberl, K. Schlacher, Geometric Analysis of Hamiltonian Mechanics using Connections, *Proceedings in Applied Mathematics and Mechanics*, 6(1), pp. 843-844, 2006.
58. M. Schöberl, K. Schlacher, Intrinsic Modeling of Mechanical Systems Based on Geometry, *CD Proceedings of the 5th Vienna Symposium on Mathematical Modelling (MATHMOD)*, 2006.
59. K. Schlacher, M. Schöberl, H. Ennsbrunner, Simple Elastic Systems, An Introduction Based on Geometry, *CD Proceedings of the 5th Vienna Symposium on Mathematical Modelling (MATHMOD)*, 2006.

TALKS

CONTRIBUTED TALKS (PEER-REVIEWED CONFERENCES)

1. Energy-based control and observer design for higher-order infinite-dimensional port-hamiltonian systems, *7th IFAC Workshop on Lagrangian and Hamiltonian Methods for Nonlinear Control*, Berlin, Germany, 2021
2. Analysis and Comparison of Port-Hamiltonian Formulations for Field Theories - demonstrated by means of the Mindlin plate, *European Control Conference (ECC)*, Zürich, Switzerland, 2013.

3. On the port-Hamiltonian representation of systems described by partial differential equations, *4th IFAC Workshop on Lagrangian and Hamiltonian Methods for Non Linear Control*, Bertinoro, Italy, 2012.
4. On Casimir Functionals for Field Theories in Port-Hamiltonian Description for Control Purposes, *50th IEEE Conference on Decision and Control (CDC)*, Orlando, 2011.
5. On calculating flat outputs for Pfaffian systems by a reduction procedure - demonstrated by means of the VTOL example, *9th IEEE International Conference on Control & Automation, ICCA'11*, Santiago, Chile, 2011.
6. On parametrizations for a special class of nonlinear systems, *IFAC Symposium on Nonlinear Control Systems (NOLCOS)*, Bologna, Italy, 2010.
7. System parametrization using affine derivative systems, *19th International Symposium on Mathematical Theory of Networks & Systems (MTNS)*, Budapest, Hungary, 2010.
8. A Geometric Description Of Particle Mechanics Including Electromagnetism, *18th International Symposium on Mathematical Theory of Networks & Systems (MTNS)*, Blacksburg, United States, 2008.
9. Classical mechanics and electromagnetism - A covariant view, *XXII International Congress of Theoretical and Applied Mechanics (ICTAM)*, Adelaide, Australia, 2008.

CONTRIBUTED TALKS (CONFERENCES, WORKSHOPS)

1. Verteilt-parametrische Tor-basierte Hamiltonsche Systeme, *GMA Fachausschuss*, Anif, Austria, 2017.
2. Eine Dreieckszerlegung für nichtlineare zeitdiskrete Systeme, *GMA Fachausschuss*, Anif, Austria, 2015.
3. Normalformen für flache Systeme, *18. Workshop GAMM-Fachausschuss "Dynamik und Regelungstheorie"*, Hamburg, Germany, 2015.
4. Lagrange'sche und Port-Hamilton'sche Beschreibung verteilt-parametrischer Systeme, *GMA Fachausschuss*, Anif, Austria, 2014.
5. Exakte Linearisierung und Flachheit - Ein Zugang basierend auf Differentialformen, *GMA Fachausschuss*, Anif, Austria, 2013.
6. Zur Berechnung flacher Ausgänge für Pfaffsche Systeme, *GMA Fachausschuss*, Anif, Austria, 2011.
7. Some remarks on affine derivative systems concerning flatness, *81st Meeting of the International Association of Applied Mathematics and Mechanics*, Karlsruhe, Germany, 2010.
8. Hamiltonsche Systeme in evolutionärer und De Donder-Weyl Beschreibung, *GMA Fachausschuss*, Anif, Austria, 2009.
9. Geometric Analysis of Hamiltonian Mechanics using Connections, *77th Meeting of the International Association of Applied Mathematics and Mechanics*, Berlin, Germany, 2006.
10. Zur Geometrie mechanischer Systeme, Dynamics and Control theory, *GAMM Fachausschuss*, Linz, Austria, 2005.

INVITED TALKS AT CONFERENCES/WORKSHOPS

1. On a geometric test for the flatness of nonlinear difference equations, *SIAM Conference on Applied Algebraic Geometry (AG21)*, Virtual Conference, 2021.
2. Differential Parametrizations for the Feedforward Control of an Euler-Bernoulli Beam, *4th International Workshop on Advanced Dynamics and Model Based Control of Structures and Machines*, Linz, Austria, 2019.
3. Variational Principles for Different Representations of Lagrangian and Hamiltonian Systems, *2nd International Workshop on Advanced Dynamics and Model Based Control of Structures and Machines*, Vienna, Austria, 2015.
4. Port-Hamiltonian formulation for Higher-order PDEs, *5th IFAC Workshop on Lagrangian and Hamiltonian Methods for Non Linear Control*, Lyon, France, 2015.
5. Lagrangian and Port-Hamiltonian formulation for Distributed-parameter systems, *8th Vienna Symposium on Mathematical Modelling (MATHMOD)*, Vienna, Austria, 2015.
6. Port-Hamiltonian Systems on Jet Bundles, *Port-Hamiltonian Systems: Approximations, Theory and Practice, Lorentz Center Workshop*, Leiden, Netherlands, 2014.
7. Modelling and control of infinite-dimensional mechanical systems - A port-Hamiltonian approach, *Multibody System Dynamics, Robotics and Control Workshop*, 2011, Linz.
8. Geometric Aspects of First Order Field Theories in Piezoelectricity and Magnetohydrodynamics, *International Conference on Electromagnetics in Advanced Applications (ICEAA)*, Sydney, Australia, 2010.
9. Hamiltonian Field Theory and Mechanics, *6th Vienna International Conference on Mathematical Modelling (MATHMOD)*, Vienna, Austria, 2010.
10. Some aspects of differential geometry in mechanics and electromagnetism, *Workshop on Advanced Computational Electromagnetics*, Rome, Italy, 2009.
11. Time Variant Hamiltonian Control Systems - A Covariant Approach, *6th International Congress on Industrial and Applied Mathematics*, Zürich, Switzerland, 2007.
12. Intrinsic Modeling of Mechanical Systems Based on Geometry, *5th Vienna Symposium on Mathematical Modelling (MATHMOD)*, Vienna, Austria, 2006.
13. Nonlinear Control of Mechanical Systems based on their Geometric Description, *RICAM (Johann Radon Institute for Computational and Applied Mathematics), Computational Mechanics Challenges Day*, Linz, 2005.

SEMINAR TALKS AND LECTURES

1. Triangularisierung nichtlinearer Mehrgrößensysteme zur Bestimmung flacher Ausgänge, EEI Kolloquium, University Erlangen-Nürnberg, December 15th, 2014
2. Modelling of infinite-dimensional systems in a Hamiltonian framework. *MTNS 2014, Mini Course, Groningen*, July 8th, 2014.

3. Geometric Modelling, Analysis and Control of Infinite-Dimensional Port-Hamiltonian Systems, *DISC-Summer-school, University of Twente*, June 20th, 2013.
4. Analysis of Port-Hamiltonian Formulations for first-order Field-Theories, *Systems, Control and Applied Analysis Seminar, University of Groningen*, February 12th, 2013.
5. Constructive derivation of a normal form in triangular shape for flat Pfaffian systems, *CAS Seminar, Centre Automatique et Systèmes, Ecole de Mines, Paris*, July, 5th, 2012.
6. A Simple Algorithm for the Construction of Flat Outputs, *CAS Seminar, Centre Automatique et Systèmes, Fontainebleau*, February, 18th, 2008. (joint presentation with Kurt Schlacher)

MISCELLANEOUS

RESEARCH VISITS

- | | |
|-----------------|---|
| 06/2012-07/2012 | Centre Automatique et Systèmes, Mines ParisTech, France, Prof. P. Rouchon and Prof. J. Levine (6 weeks) |
| 02/2013 | Groningen Center for Systems and Control, Netherlands, Prof. A. van der Schaft (2 weeks) |
| 06/2013 | Groningen Center for Systems and Control, Netherlands, Prof. A. van der Schaft (4 weeks) |
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MEMBERSHIP IN TECHNICAL COMMITTEES

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|---------------|-------------------------------|
| IFAC T.C. 2.3 | Non-Linear Control Systems |
| IFAC T.C. 2.6 | Distributed Parameter Systems |
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ATTENDED WORKSHOPS/SUMMER SCHOOLS/COLLOQUIA

1. Algebraic Methods in Control: Theory and Practice, Lecturer: Prof. Michel Fliess, Linz, 2002.
2. Energy and Geometry in Nonlinear Control, Lecturer: Prof. Arjan van der Schaft, Linz, 2004.
3. Identification, State Reconstruction, and Generalized PI-Control, Lecturers: Prof. Michel Fliess, Prof. Herbertt Sira Ramirez, Munich, 2005.
4. Robust Autonomous Control: An Internal Model Approach, Lecturer: Prof. Alberto Isidori, Linz, 2006.
5. 11th International Summer School in Global Analysis and Applications, Lecturers: Prof. Janos Szenthe, Prof. Raffaele Vitolo, Spiska Stara Ves, 2006.
6. 12th International Summer School in Global Analysis and Applications, Lecturers: Prof. Peter Olver, Prof. Demeter Krupka, Bratislava, 2007.
7. 14th International Summer School in Global Analysis and Mathematical Physics, Lecturers: Prof. Mark J. Gotay, Prof. Yvette Kosmann-Schwarzbach, Olomouc, 2009.

8. 43. Regelungstechnisches Kolloquium in Boppard, 2009.
9. 15th International Summer School in Global Analysis and Mathematical Physics, Lecturers: Prof. Olga Krupkova, Prof. Donghua Shi, Prof. Demeter Krupka, Sloup, 2010.
10. 52. Regelungstechnisches Kolloquium in Boppard, 2018.