Manfred Kaltenbacher
Graz University of Technology
Institute of Fundamentals and Theory in Electrical Engineering (4370)

Scientific Career

2020 -	Head of Institute of Fundamentals and Theory in Electrical Engineering, TU Graz, Austria
2012 - 2021	Full Professor for Measurement and Actuator Technology, Institute of Mechanics and Mechatronics, TU Wien, Austria
2008 2012	Full Professor for Applied Mechatronics, Institute of Smart System Technologies, University of Klagenfurt, Austria
	PostDoc, Department of Sensor Technology, Friedrich-Alexander University Erlangen-Nuremberg, Germany
1992 - 1999	Research and teaching assistant, Institute of Measurement Technology, Johannes Kepler University Linz, Austria

Honors

Doctor Honoris Causa (Dr. h.c.) from Budapest University of Technology and Economics
Kaltenbacher, M. (Recipient), 2020

Österreichische Akademie der Wissenschaft
Kaltenbacher, M. (Recipient), 2017

Activities

Acta Acustica (Journal)
Kaltenbacher, M. (Editor)
1 May 2020 → …

International Commission for Acoustics (External organisation)
Kaltenbacher, M. (Member)
1 Oct 2019 → 30 Sept 2022

Österreichische Akademie der Wissenschaften (External organisation)
Kaltenbacher, M. (Member)
1 May 2017 → …

DEGA - Deutsche Gesellschaft für Akustik e.V. (External organisation)
Kaltenbacher, M. (Member)
Mar 2017 → …

Acta Mechanica (Journal)
Kaltenbacher, M. (Editorial board member)
2017 → …

Austrian Acoustics Association (External organisation)
Kaltenbacher, M. (Chair)
2017 → …

Austrian National Committee for Theoretical and Applied Mechanics (External organisation)
Kaltenbacher, M. (Chair)

2017 → …

Gesellschaft für Angewandte Mathematik und Mechanik e.V. (External organisation)
Kaltenbacher, M. (Member)
2016 → …

Journal of Theoretical and Computational Acoustics (Journal)
Kaltenbacher, M. (Editorial board member)
2013 → …

The American Institute of Aeronautics and Astronautics (External organisation)
Kaltenbacher, M. (Member)
2005 → …

International Compumag Society (External organisation)
Kaltenbacher, M. (Member)
1999 → …

IEEE Magnetics Society (External organisation)
Kaltenbacher, M. (Member)
1997 → …

Journal publications (at TU Graz)

On nonlinear magnetic field solvers using local Quasi-Newton updates
Egger, H., Engertsberger, F., Domenig, L., Roppert, K. & Kaltenbacher, M., 1 Apr 2025, In: Computers and Mathematics with Applications. 183, p. 20-31 12 p.

On forward and inverse energy-based magnetic vector hysteresis operators
Egger, H., Engertsberger, F., Domenig, L., Roppert, K. & Kaltenbacher, M., Apr 2025, In: IEEE Transactions on Magnetics. 61, 4

A time-stepping algorithm for hysteretic lumped-element transformer models
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A time-domain finite element formulation of the equivalent fluid model for the acoustic wave equation
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A Moving Mesh Method for Fluid-Solid-Acoustic Interactions in MEMS Devices
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arterioscope.sim: Enabling Simulations of Blood Flow and Its Impact on Bioimpedance Signals
Krispel, T., Badeli, V., Jafarinia, A., Reinbacher-Köstinger, A., Tronstad, C., Ranftl, S., Martinsen, Ø. G., Kalvoy, H., Hisdal, J., Kaltenbacher, M. & Hochrainer, T., 15 Dec 2024, In: Bioengineering. 11, 12, 1273.

Revisiting the dry friction-like magnetic vector hysteresis model
Sauseng, A., Kaltenbacher, M. & Roppert, K., 15 Aug 2024, In: Journal of Magnetism and Magnetic Materials. 604, 172285.

Comparison of a quasi Newton method using Broyden's update formula and an adjoint method for determining local magnetic material properties of electrical steel sheets

Gschwentner, A., Kaltenbacher, M., Kaltenbacher, B. & Roppert, K., 30 Jul 2024, In: COMPEL - The International Journal for Computation and Mathematics in Electrical and Electronic Engineering. 43, 4, p. 962-976 15 p.

Hybrid aeroacoustic investigation of turbulent 90∘ pipe bend flow with source terms from Large-Eddy Simulation
Tieber, J., Steiner, H., Maurerlehner, P., Schoder, S., Schäfer, K., Ennemoser, A., Kaltenbacher, M. & Brenn, G., 30 Jul 2024, In: Computers & Fluids. 279, 14 p., 106323.

Optimization of Sensor Placement for a Measurement System for the Determination of Local Magnetic Material Properties
Reinbacher-Köstinger, A., Gschwentner, A., Museljic, E. & Kaltenbacher, M., 16 Jul 2024, In: Mathematics. 12, 14, 2220.

Incorporation of a 3D Energy-Based Vector Hysteresis Model into the Finite Element Method using a Reduced Scalar Potential Formulation
Domenig, L. D., Roppert, K. & Kaltenbacher, M., 1 Jun 2024, In: IEEE Transactions on Magnetics. 60, 6, p. 1-8 8 p., 7300708.

Inverse Scheme to Locally Determine Nonlinear Magnetic Material Properties: Numerical Case Study
Kaltenbacher, M., Gschwentner, A., Kaltenbacher, B., Ulbrich, S. & Reinbacher-Köstinger, A., May 2024, In: Mathematics. 12, 10, 1586.

Evaluation of an Analytical Equivalent Hertzian Dipole Representation in TEM-Cells applying the Finite Element Method
Kreindl, D., Bauernfeind, T., Weiss, B., Stockreiter, C. & Kaltenbacher, M., 1 Mar 2024, In: IEEE Transactions on Magnetics. 60, 3, p. 1-4 4 p., 7401204.

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Museljic, E., Roppert, K., Domenig, L. D., Reinbacher-Köstinger, A. & Kaltenbacher, M., 14 Dec 2023, In: International Journal of Applied Electromagnetics and Mechanics. 73, 4, p. 415-427 13 p.

A validated finite element model for room acoustic treatments with edge absorbers
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Determination of Local Magnetic Material Properties using an Inverse Scheme
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High-order non-conforming discontinuous Galerkin methods for the acoustic conservation equations
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3D modeling of inductive and capacitive coupling between surface-mounted multilayer-capacitors
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An approach for modal coupling based on experimental and computed modes using non-conforming grids
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Error detection and filtering of incompressible flow simulations for aeroacoustic predictions of human voice
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Fundamental Investigation of Wave Propagation inside IC-Striplines upon Excitation with Hertzian Dipole Moments
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Numerical Investigation of Signal Launch Imperfections for Edge Mount RF Connectors
Riener, C. M., Bauernfeind, T., Kvasnicka, S., Roppert, K., Hackl, H. & Kaltenbacher, M., 1 Jul 2022, In: Electronics. 11, 13, 1990.

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Predicting Spatial Distributions of Lighthill's Aeroacoustic Source Terms Using Steady-State RANS Simulations in Turbocharger Compressors
Freidhager, C., Maurerlehner, P., Roppert, K., Heinisch, M., Renz, A., Schoder, S. & Kaltenbacher, M., 1 Jan 2022, In: Journal of Aerospace Engineering. 35, 1, 14 p., 04021101.

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Maurerlehner, P., Schoder, S., Tieber, J., Freidhager, C., Steiner, H., Brenn, G., Schäfer, K.-H., Ennemoser, A. & Kaltenbacher, M., 2022, In: Acta Acustica. 6, 14 p., 45.

Applicability of two hybrid sound prediction methods for assessing in-duct sound absorbers of turbocharger compressors
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A New Method for Sound Generation Based on Digital Sound Reconstruction
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Simulationen von Strömungsakustik in rotierenden Bauteilen zur Entwicklung von Antriebskonzepten der Autos der Zukunft
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3D-FV-FE aeroacoustic larynx model for investigation of functional based voice disorders
Falk, S., Kniesburges, S., Schoder, S., Jakubaß, B., Maurerlehner, P., Echternach, M., Kaltenbacher, M. & Döllinger, M., 8 Mar 2021, In: Frontiers in Physiology. 12, 616985.

Aeroacoustic Sound Source Characterization of the Human Voice Production - Perturbed Convective Wave Equation
Schoder, S., Maurerlehner, P., Wurzinger, A., Hauser, A., Falk, S., Kniesburges, S., Döllinger, M. & Kaltenbacher, M., 2 Mar 2021, In: Applied Sciences. 11, 6, 2614.

Sliding Non-Conforming Interfaces for Edge Elements in Eddy Current Problems
Roppert, K., Schoder, S., Wallinger, G. & Kaltenbacher, M., 1 Mar 2021, In: IEEE Transactions on Magnetics. 57, 3, p. 1-6 6 p., 9312633.

Application limits of conservative source interpolation methods using a low Mach number hybrid aeroacoustic workflow
Schoder, S., Wurzinger, A., Junger, C., Weitz, M., Freidhager, C., Roppert, K. & Kaltenbacher, M., Mar 2021, In: Journal of Theoretical and Computational Acoustics. 29, 1, 2050032.

Influence of a micro-perforated duct absorber on sound emission and performance of axial fans
Czwielong, F., Floss, S., Kaltenbacher, M. & Becker, S., Mar 2021, In: Applied Acoustics. 174, 107746.

Impact of the Sub-Grid Scale Turbulence Model in Aeroacoustic Simulation of Human Voice
Lasota, M., Šidlof, P., Kaltenbacher, M. & Schoder, S., 2 Feb 2021, In: Applied Sciences. 11, 4, p. 1-19 19 p., 1970.

A pseudo density topology optimization approach in nonlinear electromagnetism applied to a 3D actuator
Seebacher, P., Kaltenbacher, M., Wein, F. & Lehmann, H., 2021, In: International Journal of Applied Electromagnetics and Mechanics. 65, 3, p. 545-559 15 p.

Capabilities of inverse scheme for acoustic source localization at low frequencies
Gombots, S., Kaltenbacher, M. & Kaltenbacher, B., 2021, In: Acta Acustica. 5, 44.

Design of an in-duct micro-perforated panel absorber for axial fan noise attenuation
Floss, S., Czwielong , F., Kaltenbacher, M. & Becker, S., 2021, In: Acta Acustica. 5, 24.

Efficient numerical simulation of the human voice: simVoice – a three-dimensional simulation model based on a hybrid aeroacoustic approach
Maurerlehner, P., Schoder, S., Freidhager, C., Wurzinger, A., Hauser, A., Kraxberger, F., Falk, S., Kniesburges, S., Echternach, M., Döllinger, M. & Kaltenbacher, M., 2021, In: Elektrotechnik und Informationstechnik. 138, 3, p. 219-228 10 p.

Sound reduction in heat exchanger modules by integrating plate absorbers with sub-millimeter openings
Czwielong, F., Floss, S., Kaltenbacher, M. & Becker, S., 2021, In: Acta Acustica. 5, 35.

Helmholtz's decomposition for compressible flows and its application to computational aeroacoustics
Schoder, S., Roppert, K. & Kaltenbacher, M., 6 Nov 2020, In: Partial Differential Equations and Applications. 1, 20 p., 46.

Computational aeroacoustics of the EAA benchmark case of an axial fan
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Bi-Stable Aluminum Nitride-Based Piezoelectric Micromachined Ultrasonic Transducer (PMUT)
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Schoder, S., Roppert, K., Weitz, M., Junger, C. & Kaltenbacher, M., 15 May 2020, In: International Journal for Numerical Methods in Engineering. 121, 9, p. 2051-2067 17 p.

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Schoder, S., Weitz, M., Maurerlehner, P., Hauser, A., Falk, S., Kniesburges, S., Doellinger, M. & Kaltenbacher, M., Feb 2020, In: The Journal of the Acoustical Society of America. 147, 2, p. 1179-1194 16 p., 1179.

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Numerical investigation of the resonance behavior of flow-excited Helmholtz resonators
Weitz, M., Schoder, S. & Kaltenbacher, M., 2019, In: Proceedings in Applied Mathematics and Mechanics . 19, 1, 2 p.

Simulating induction heating processes using harmonic balance FEM
Roppert, K., Toth, F. & Kaltenbacher, M., 2019, In: COMPEL - The International Journal for Computation and Mathematics in Electrical and Electronic Engineering. 2019, 5, p. 1562-1574

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