

# Curriculum Vitae - Univ. Prof. Dr.-Ing. ANNETTE MÜTZE

## CONTACT

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## EDUCATION

2000 – 2004

Technical University of Darmstadt. PhD Studies. Title of Thesis: “Bearing Currents in Inverter-Fed AC Motors”. Mark: summa cum laude (highest grade)

*Coordinated double-degree program: Ingénieur Générale and Dipl.-Ing. Degrees*

1993 – 1999

Ecole Centrale de Lyon, France, General Engineering (best of a class of 300 students)

1993 – 1999

Technical University Darmstadt, Germany, Electrical Engineering

## WORK EXPERIENCE

Since 04.2010

Graz University of Technology, Austria – Univ.-Prof. Research and Teaching in the Area of Electric Drives and Machines. Supervision of Bachelor-, Master-, and PhD Theses. Head of Electric Drives and Machines Institute.

01.2007 – 03.2010

University of Warwick, School of Engineering, UK – Associate Professor, Assistant Professor (until Sep 08) Research and Teaching in the Area of Electric Drives and Machines. Supervision of Bachelor-, Master-, and PhD Theses.

05.2004 – 12.2007

University of Wisconsin-Madison, USA, on leave Jan 07 - Dec 07 – Assistant Professor (until Sep 08) Research and teaching in the area of Electric Drives and Machines. Supervision of Bachelor-, Master- and PhD Theses.

04.2000 – 04.2004 (Project Ass.)

Technical University of Darmstadt, Germany – Research Assistant. Research and teaching in the area of Electric Drives and Machines. Supervision of Master Theses.

1993 – 1999

In total 14 months of industrial placements (in Germany, France, USA)

## MAIN RESEARCH AREAS

My research interests are in the field of electric drive and power electronic systems. Most of the research questions I have addressed are if the interdisciplinary character, bridging the gaps between electric engineering, material sciences, maths, and systems engineering. I thereby increase the reliability, efficiency, and utilization of variable speed drive systems by addressing the interaction between the different components of the system. For example, my work on inverter-induced bearing currents laid the solid theoretical foundations and combined these with practical evaluation methods that can today be found in the presentations of many drive manufacturers. My pioneering work on the influence of the manufacturing process on steel performance is cited in almost every publication on this topic. It also sets the stage for the experimental analyses of this project that bridge the gaps towards electric engineering applications. My work with fractional horsepower drives has translated in an integrated auxiliary fan drive that is sold to the automotive quantity in great quantities, as well as new control approaches and drive topologies that are in the evaluation phase for mass production.

## 10 SELECTED ACADEMIC PUBLICATIONS (ALL PEER REVIEWED)

A. Muetze and A. Binder. 'Calculation of circulating bearing currents in machines of inverter based drive systems'. In: IEEE Transactions on Industrial Electronics 54.2 (2007), pp. 932-938. issn: 0278-0046. doi: 10.1109/TIE.2007.892001

A. Muetze, J. Tamminen, and J. Ahola. 'Influence of motor operating parameters on discharge bearing current activity'. In: IEEE Transactions on Industry Applications 47.4 (2011), pp. 1767-1777. issn: 0093-9994. doi: 10.1109/TIA.2011.2154353

A. Muetze and C. R. Sullivan. 'Simplified design of common-mode chokes for reduction of motor ground currents in inverter drives'. In: IEEE Transactions on Industry Applications 47.6 (2011), pp. 2570-2577. issn: 0093-9994. doi: 10.1109/TIA.2011.2170101

C. Paar, A. Muetze, and H. Kolbe. 'Influence of machine integration on the thermal behaviour of a PM drive for hybrid electric traction'. In: IEEE Transactions on Industry Applications 51.5 (2015), pp. 3914-3922. issn: 0093-9994. doi: 10.1109/TIA.2015.2427280

M. Bali, H. De Gersem, and A. Muetze. 'Determination of original nondegraded and fully degraded magnetic properties of material subjected to mechanical cutting'. In: IEEE Transactions on Industry Applications 52.3 (May 2016), pp. 2297-2305. issn: 0093-9994. doi: 10.1109/TIA.2016.2532288

K. Lang et al. 'Comparison of induction and synchronous reluctance machine based actuators for elevated temperature environments'. In: IEEE Transactions on Energy Conversion 31.3 (2016), pp. 1012-1022. issn: 0885-8969. doi: 10.1109/TEC.2016.2556716

M. Bali and A. Muetze. 'The degradation depth of non-grain oriented electrical steel sheets of electric machines due to mechanical and laser cutting: a state-of-the-art review'. In: IEEE Transactions on Industry Applications 55.1 (2019), pp. 366-375. issn: 0093-9994. doi: 10.1109/TIA.2018.2868033

S. Leitner, H. Gruebler and A. Muetze. 'Innovative Low-Cost Sub-Fractional HP BLDC Claw-Pole Machine Design for Fan Applications'. In: IEEE Transactions on Industry Applications 55.3 (May 2019), pp. 2558-2568. issn: 0093-9994. doi: 10.1109/tia.2019.2892023 ; 2019 IEEE Transactions Industry Applications Best Paper Award First Prize

S. Leitner, G. Krenn and A. Muetze. 'Rheometer-based cogging and hysteresis torque and iron loss determination of sub-fractional horsepower motors'. In: IEEE Transactions on Industry Applications 56.4 (2020), pp. 3679-3690. issn: 0093-9994. doi: 10.1109/TIA.2020.2990876

T. Holzer et al. 'Generator design possibilities for full-size converter operation of large pumped storage power plants'. In: IEEE Transactions on Industry Applications 56.4 (2020), pp. 3644-3655. issn: 0093-9994. doi: 10.1109/TIA.2020.2989074

## **AWARDS (Selected)**

2020 6th Nagamori Award

2019 IEEE Transactions on Industry Application Best Paper Award, First Prize (international, one of the most important international journal in the field of electric engineering with more than 720 papers published per year).

2018-19 Visiting Professor, Technische Universität Darmstadt, Germany ("KI<sup>2</sup>VA" program: Competence Development through Interdisciplinary and International Cooperation from the Start)

2016 Fellow, IEEE

2016 IEEE Industry Applications Magazine Best Paper Award, Second Prize (international, one of the most important international journal in the field of electric engineering, with a special focus on the unique needs of industry and commerce).

2005 National Science Foundation CAREER Award (national, USA; highest honour bestowed by the US Government on science and engineering professionals in the early stages of their independent research careers).

2004 FAG Kugelfischer Corporation Innovation Award (national, Germany), one of the most prestigious awards of a technical foundation.

## **KEYNOTE SPEAKER**

A. Muetze, "New auxiliary drives for automotive applications," 2019 IEEE Transportation Electrification Conference and Exposition (ITEC), Novi, MI, 19-21 June 2019.

A. Muetze, "Innovative low-cost sub-fractional HP BLDC claw-pole machine design for fan applications," EPSRC Centre for Power Electronics Annual Conference 2019, Loughborough, UK, 4-5 July 2019.

A. Muetze, 2021 IEEE Applied Power Electronics Conference (APEC), Phoenix, 9-13 June 2021.