

CURRICULUM VITAE
Flemming Buus Bendixen, M. Sc. E. E., PhD.
Printed: 2024-01-04
Last update: 2023-12-13

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| Name: | Flemming Buus Bendixen |
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| Education: | M.Sc.E.E., 1997, Aalborg University |
| | Industrial PhD., 2006, Aalborg University |



Education projects:

- E4: Asynkronmotor eller synkron-reluktansmotor til drejebænk
- E5: Hastighedsstyring af DC-motor
- E6: Positionsregulering af robotsystem
- E7: Software til transient simulering af én-faset asynkronmotor med driftskondensator
- E8: Dimensionering og konstruktion af resonansinverter
- E9: Rippelfrit moment for switched reluktans motor
- E10: Forbedring af nyttevirkning for asynkronmotor påtrykt PWM-spænding

Previous positions:

- Development engineer in the motor-department in Grundfos A/S 1997-2003.
- Industrial PhD. 1/1-2002 to 31/12-2005 (Collaboration between Grundfos A/S, Vestas Wind Systems A/S, Akademiet for de tekniske videnskaber and Aalborg University). Theme “Segmented motor drive”
- Development engineer in the software control development department in Vestas Wind Systems A/S 2003-2007.
- Consultant engineer in magnetic calculations for Sintex a/s 1999-2007.
- Teacher in analogue and digital electrical systems at Higher Technical Examination Programme (HTX) in Hobro 2013-2017.
- Magnet specialist in development department in Sintex a/s 2007-2013.
- Appointed to local patent ambassador for Grundfos management a/s 2013-2023.
- Senior magnetism expert in Sintex development department 2013-2023.

Positions held:

- Consultant engineer in magnetic calculations (BuusMag CVR: 21967408) for various customers since 1999.
- Member of the Danish censor Corps since 2002. More than 92 (18/12 2023) student projects and one PhD project. Hundreds of individual oral exams.

Memberships/chairmanships:

- Committee member and treasurer in Danish Magnetic Society 2001-2022. <https://www.danskmagnetiskforening.dk/>
- Committee member and chairman in Danish Magnetic Society since 2022. <https://www.danskmagnetiskforening.dk/>
- Associate Member of the UK Magnetics Society Committee 2013 - 2016.
- Committee member in IDA Nord electro since 2022.

Teaching experience:

- Course: 2 days motor course at Grundfos A/S 15-16/11 2000.
- Course: Magnet course at Sintex A/S 14/6 2000.
- Senior seminar: Magnetic materials at Grundfos A/S 14/5-2002.

- 10th semester supervisor: Control of Six-phase motor by Umar Badshah Khan Aalborg University.
- Ph.D. supervision: SHARK project at Aalborg university, 2000, Ana Mari Tataru.
- Course. 2 days magnetism and magnets at DALI A/S 22/3 + 10/4 2005.
- Internal course on magnetism and magnetic materials: 17/8-2010, 6/1-2011, 30/5-2012, 14/5-2014, 10/11-2016, 10/5-2017
- Internal course on torque couplings: 21/5-2014
- IDA course on magnetic materials: 12/9-2016
- Two day advanced course on magnetic materials UK magnetics society: 16/8-2016
- Two day advanced course on magnetism and magnetic materials: 25/10-2016
- 10th semester supervisor: Performance Study and Design Improvement of a Magnetic Coupling by Stig Högberg Technical University of Denmark.
- Ph.D. supervision: REE-gain project at Technical University of Denmark, 2013, Stig Högberg.
- 1 day: Internal workshop on magnetic couplings. Sintex. 7/9-2017.
- Bachelor supervision, Tanja Johnson: Analysis of Eddy Current Loss in the Separator Can of Magnetic Couplings, 18/1-2018
- EPMA webinar about SMC, 29/10-2020
- Internal course module on magnetism and magnetic materials:
 - A (25/10-2018 + 2/6-2021 + 29/10-2021 + 29/6-2022)
 - B (29/5-2019)
 - C (11/9-2019)
- SMC webinar 25/6-2021 online course about SMC and applications
- Magnetism workshw for costumer 1/11-2021
- Linearisering af højttalere ved brug af SMC. IDA seminar 2/3-2022.

International collaboration/contacts:

- Prof. Timm Miller, University Glasgow, UK
- Prof. Thomas Jahns, WEMPEC, University of Madison, Wisconsin, USA
- Prof. Thomas Lipo, WEMPEC, University of Madison, Wisconsin, USA
- Prof. Ion Boldea, Politehnica University of Timisoara, Romania
- Dr. Bernd Grieb, Magnequench GmbH, Tübingen, Germany

Consultancy for:

- Sintex A/S, Jyllandsvej 14, DK-9500 Hobro
- Bang & Olufsen Medicom A/S, Gimsinglundvej 20, DK-7600 Struer
- Roblon, Kjeldgaardsvej 6, DK-9300 Sæby
- Digianswer, Skalhuse 5, DK-9240 Nibe
- Kamstrup A/S, Jacob Knudsens vej 12, DK-8230 Åbyhøj
- Trevira Neckelmann A/S, Kejlstrupvej 84, DK-8600 Silkeborg
- Zig Zag Birds ApS, Rudolfgårdsvej 1B, DK-8260 Viby J
- DALI A/S, Dali Allé 1, 9610 Nørager
- Windsensor, Søkrogen 9, 4000 Roskilde
- And more...

Research projects:

- EFPM, Software for design of electrical motors, 1997-2001 (Energy research means, sponsored by the Danish Ministry of Energy)
- MagCool: http://www.risoe.dtu.dk/Research/sustainable_energy/new_energy_technologies/projects/magnetic_cooling/physics.aspx
- Green Magnets: <http://www.greenmagnets.dk/>
- High Efficient Car of the Future, Jan. 2010 – Jan. 2013, together with Aalborg University Institute of energy technology <http://www.et.aau.dk/>
- IEPE: <http://www.iepe.et.aau.dk/>
- Inducat: <https://www.energiforskning.dk/da/project/inducat-induktionsopvarmet-katalytisk-brintproduktion>
- MagFly: <https://www.energiforskning.dk/da/project/magfly-novel-magnets-flywheel-energy-storage>
- PUMP HiTS: <https://energiforskning.dk/node/9748>

- e-SMR 2019-2023: <https://www.energiforskning.dk/da/project/esmr-meoh-biogas-til-meoh-ved-elektrisk-reforming>

Product projects:

- SQ-Flex, Dimensioning of high efficient permanent magnet motor for submersible pump using solar panels and wind generator 1997-2002.
- VCS-vector, New software for wind turbines.
- A linear drive magnetic system for loudspeakers i.e. Epicon 6:
 - <http://www.dali-speakers.com/en-US/Loudspeakers-1/EPICON-6-1.aspx>
- Green magnets dipole for particle accelerators
- Major shareholder and developer of Wind Heat Silence:
 - https://www.energy-supply.dk/article/view/562771/dansk_vindturbin_skal_producere_varme
- Consultancy on hundreds of customer projects for Sintex a/s.

Publications:

1. Introduction to permanent magnets, course in Helsinki University of Technology, Finland, Part 1
2. Demagnetizing and testing, course in Helsinki University of Technology, Finland, Part 2
3. Permanent magnets - Demagnetization, course in Helsinki University of Technology, Finland, Part 3
4. The multiphased induction motor drive - a better motor drive! course in Writing and Reviewing Scientific Papers Aalborg University 2003.
5. Controlling the Dc-link Midpoint Potential in a Six-phase Motor-drive, PESC04 Aachen, June 20-25-2004.
6. Den multi-fasede motor – et alternative til den klassiske motor, Teknisk nyt special 36/2003.
7. Incapsulated Powder Magnets - Design Opportunities and Production Attributes, Magnetics 2010, Orlando, Florida, USA.
8. Characterization of 50/60 Hz current transformers from 20 Hz to 10 kHz - Power Electronics, Electrical Drives, Automation and Motion, 2006. SPEEDAM 2006.
9. Magnetic couplings and how to transfer torque from a dry to a wet environment - Incl. the challenges of can loss in the system. Coil winding 2011 Berlin.
10. Permanent magnets in accelerators can save energy, space and cost. F. Bødker, L.O. Baandrup, N. Hauge, K.F. Laurberg, G. Nielsen, A. Baurichter, B.R. Nielsen, Danfysik A/S, Taastrup, Denmark F.B. Bendixen, P. Valler, P. Kjeldsteen, Sintex A/S, Hobro, Denmark H.D. Thomsen, O. Balling, S.P. Møller, Aarhus University, Aarhus, Denmark H.A. Synal, Swiss Federal Institute of Technology (ETH), Zürich, Switzerland
11. “Design and Demonstration of a Test-rig For Static - Performance-Studies of Permanent Magnet Couplings” IEEE TRANSACTIONS ON MAGNETICS, Stig Högberg, Graduate Student Member, IEEE, Bogi Bech Jensen and Flemming Buus Bendixen, Member, IEEE
12. “Improving Torque Per Kilogram Magnet of Permanent Magnet Couplings Using Finite Element Analysis” IEMDC, Stig Högberg, Graduate Student Member, IEEE, Bogi Bech Jensen, Member, IEEE, and Flemming Buus Bendixen, Member, IEEE.
13. “Influence of End-Effects on Static Torque Performance of Misaligned Cylindrical Permanent Magnet Couplings” ICEM, Stig Högberg, Hilary Hansen, Bogi Bech Jensen and Flemming Buus Bendixen.
14. “Influence of Demagnetization-Temperature on Magnetic Performance of Recycled Nd-Fe-B Magnets” IEMDC, Stig Högberg, Nenad Mijatovic, Flemming Buus Bendixen, Bogi Bech Jensen, Joachim Holbøll
15. “Parametric Design Optimization Of A Novel Permanent Magnet Coupling Using Finite Element Analysis” ECCE, Stig Högberg, Nenad Mijatovic, Flemming Buus Bendixen, Bogi Bech Jensen, Joachim Holbøll
16. “A Novel Cost-Effective Permanent Magnet Gear” VDI Intl. Gear, Stig Högberg, Nenad Mijatovic, Flemming Buus Bendixen, Joachim Holbøll
17. “Direct Reuse of Rare Earth Permanent Magnets - Coating Integrity” IEEE TRANSACTIONS ON MAGNETICS Vol.53, No.4, 2017. Stig Hogberg, Joachim Holbøll, Nenad Mijatovic, Bogi Bech Jensen and Flemming Buus Bendixen
18. “Magnetic Transmissions Increase Lifespan of Offshore Wind Farms” Zack Conrad, Flemming Buus Bendixen. <https://www.comsol.com/zmags/comsol-news-2018>

19. "Magnetic Transmission Design Using Multiphysics Modeling". Comsol Webinar. Flemming Buus Bendixen, Durk de Vries. <https://www.comsol.com/video/optimizing-magnetic-transmission-designs-with-comsol-oct-11-2018>
20. "Electrified methane reforming: A compact approach to greener industrial hydrogen production" Science. Sebastian T. Wismann, Jakob S. Engbæk, Søren B. Vendelbo, Flemming B. Bendixen, Winnie L. Eriksen, Kim Aasberg-Petersen, Cathrine Frandsen, Ib Chorkendorff, Peter M. Mortensen, <https://science.sciencemag.org/content/364/6442/756>
21. "Highly Accurate Experimental Heave Decay Tests with a Floating Sphere: A Public Benchmark Dataset for Model Validation of Fluid–Structure Interaction" Energies (Online), Morten Bech Kramer, Jacob Andersen, Sarah Thomas, Flemming Buus Bendixen, Harry Bingham, Robert Read, Nikolaj Holk, Edward Ransley, Scott Brown, Yi-Hsiang Yu, Thanh Toan Tran, Josh Davidson, Csaba Horvath, Carl-Erik Janson, Kim Nielsen and Claes Eskilsson, <https://www.mdpi.com/1996-1073/14/2/269>

International conferences/courses:

1. Magnetism and magnetics – an introductory course (17-19/3 1997) in University of Sunderland, UK
2. Eighth international conference on: Electrical machines and drives, IEE (1-3/9 1997) in Cambridge, UK
3. Soft magnetic materials, Gorham/Intertech Consulting (20-22 April 1998) in Barcelona, Spain
4. 15th international workshop on Rare-earth magnets and their applications (30/8-3/9 1998) in Dresden, Germany
5. 10th international symposium on magnetic anisotropy and coercivity in rare-earth transition metal alloys (4/9 1998) in Dresden Germany
6. Neodymium iron boron magnets 99', Gorham/Intertech Consulting (12-14 April 1999) in San Francisco, California, USA
7. Hard ferrite magnets 99', Gorham/Intertech Consulting (14-16 April 1999) in San Francisco, California, USA
8. Permanent magnet synchronous and brush-less DC motor drives, R. Krishnan (16-18/8 1999) in Grundfos A/S, Denmark
9. ICEM 2000 (28-30 August) in Espoo Finland, Helsinki University of Technology
10. 16th international workshop on Rare-earth magnets and their applications (10/9-13/9 2000) in Sendai Japan
11. 11th international symposium on magnetic anisotropy and coercivity in rare-earth transition metal alloys (14/9 2000) in Sendai Japan
12. 4 days SPEED course (21-24 November 2000) held at Grundfos A/S
13. EPE 2001, (27-29/8 2001) in Graz, Austria.
14. IAS 2002, (13-17 2002) in Pittsburgh, USA.
15. PESC04, (20-25 2004) in Aachen Germany.
16. EPE 2005, (11-14/9 2005) in Dresden Germany.
17. EPE 2007, (2-5/9 2007) in Aalborg Denmark.
18. Intermag 2008, (4-8/5 2008) in Madrid Spain.
19. Magnetics 2010 (28-29/1 2010) in Orlando, Florida, USA.
20. Motor, Drive and Automation Systems (28/1-29/1 2010) Orlando, Florida, USA
21. REPM 2010 (29/8-2/9 2010) in Bled, Slovenia
22. Coil winding (24/5-26/5 2011) in Berlin, Germany
23. Comsol Conference (26-28/10 2011) in Stuttgart, Germany
24. ECCE (17-22/9 2011) in Phoenix, Arizona, USA
25. Magnetic Materials in Electrical Machine Applications (13-15/6 2012) in Pori, Finland
26. Coil winding (3/6-6/6 2013) in Berlin, Germany
27. Main organizer of Materials and Applications (22-23/10) 2013 at Aalborg, Denmark
28. Patent course 20/11-2013, Bjerringbro, Denmark
29. Coil winding (23/6-26/6 2014) in Berlin, Germany
30. UKmag conference (28-29/10 2014) in Lupfig, Schweiz
31. Main organizer of UKmag conference (22-23/4 2015) in Eindhoven, Netherland
32. Coil winding (4/5-6/5 2015) in Berlin, Germany
33. Main organizer of UKmag conference (2-3/11 2015) in DTU, Lyngby, Denmark
34. The 8th IET International Conference on Power Electronics, Machines and Drives, Glasgow, Scotland, UK

35. The Battery Show - next generation electrical transport technology, Sindelfingen, Tyskland
36. International Conference on Gears 2017, FZG Forschungsstelle für Zahnräder und Getriebebau Technische Universität München
37. Comsol Conference 18-20/10 2017 Rotterdam, Netherlands.
38. Co organizer of DMF conference ESS Lund Sweden 16-17/11 2017.
39. ICEM Conference 2018, Thessaloniki, Greece.
40. Co organizer for Joint conference on “Magnetic Measurement and Sensors” UKmag/DMF conference LEGO house, Billund, Denmark. <http://ukmagsoc.org/events/magnetic-measurement-and-sensors/>
41. CWIEME Berlin, 26-28/5-2019.
42. MMA'19 “Magnetic Materials and Applications” - UK magnetics society, 18-19/9 2019, Milan, Italy.
43. ICEM 2020, “International conference on electric machines” 23-26'th August 2020, Gothenburg, Virtual conference.
44. Soft Magnetic Materials & Applications, Online UKMagSoc, 10-11/11 2020. <https://ukmagsoc.org/events/soft-magnetic-materials-applications/>
45. Magnetism 2021 (20/1 2021) Online USA.
46. Motor, Drive and Automation Systems (19/1 2021) Online USA.
47. Comsol webinar 4/2-2021: general about new version 5.6, solvers, meshing, application building, electromagnetics and more.
48. HI-Tech & industry Scandinavia + Technomania fair 7/10-2021
49. MagnetPhysik 3/11 + 12/11-2021 online: Permagraph and Remagraph Training
50. Coil winding (10-12/5-2022) in Berlin, Germany.
51. Den uformelle leder (27/2-1/3-2023) in Aarhus, Denmark
52. Coil winding (23-24/5-2023) in Berlin, Germany.
53. EPE 2023 conference (5-7/9-2023) in Aalborg, Denmark.
54. Organizer of conference in Danish magnetics society (14-15/11-2023) in Hobro, Denmark.
55. L-AUS course every year, Denmark

International stay:

- 3½ month stay at WEMPEC (August to November 2002) in University of Madison, Wisconsin, USA.

Patent applications:

1. DE10059457A1/EP1211423A1 ”Elektromotor zum antrieb einer kreiselpumpe fuer insbesondere heizungsanlagen” for Grundfos Management A/S.
2. EP2167815 (A2) ”a variable speed wind turbine, a resonant control system, a method of operating a variable speed wind turbine, use of a resonant control system and use of a method in a variable speed wind turbine” for Vestas Wind Systems A/S.
3. US2010045040 (A1) ”Variable Speed Wind Turbine With Doubly-Fed Induction Generator Compensated For Varying Rotor Speed” for Vestas Wind Systems A/S.
4. US2010033166 (A1) ”Method For Estimating The Magnetization Level Of One Or More Permanent Magnets Established In One Or More Permanent Magnet Rotors Of A Wind Turbine Generator And Wind Turbine” for Vestas Wind Systems A/S.
5. MX2008016300 (A) ”generator system with intelligent processing of position signal” for Vestas Wind Systems A/S.
6. US2010011567 (A1) ”Method For Establishing A Wind Turbine Generator With One Or More Permanent Magnet (PM) Rotors, Wind Turbine Nacelle And Wind Turbine” for Vestas Wind Systems A/S.
7. US2009164170 (A1) ”Generator system with intelligent processing of position signal” for Vestas Wind Systems A/S.
8. WO2010066455 (A1) ”permanent magnet and a method for manufacturing a permanent magnet” for Sintex a/s and Grundfos management a/s.
9. WO2012149938 (A1) “Electromagnetic drive unit” Dali a/s.
10. DK201470287 (A1) “A cap for an electro-acoustic transducer” Dali a/s.
11. WO2015106762 (A1) “INDUCTION HEATING AND STIRRING DEVICE” Sintex a/s.
12. WO2015197283 (A1) “MAGNETIC COUPLING” Grundfos Holding A/S.
13. WO2015197067 (A1) “A MAGNETIC GEAR” Grundfos Holding A/S.

14. WO2017085114 (A1) "HIGH TEMPERATURE PUMP UNIT WITH MAGNETIC COUPLING" Grundfos Holding A/S.
15. Unpublished/Withdrawn 22-09-2016 "Resistance heating of endothermic reactions"
16. WO2017207148 (A1) "Reluctant magnetic gear" Grundfos Holding A/S
17. WO2020002568 (A1) "Magnetic rack-and-pinion coupling system and sea wave energy conversion system" Grundfos Holding A/S
18. WO2019228795 (A1) "Catalyst and system for methane steam reforming by resistance heating; said catalyst's preparation" Grundfos Holding A/S, Haldor Topsøe A/S
19. EP3799086 (A1) "Permanent magnet based magnetiser" Grundfos Holding A/S
20. WO2021110835 (A1) "METHOD OF MANUFACTURING AN OBJECT BY JOINING TWO POWDER METALLURGICAL COMPONENTS" GRUNDFOS HOLDING A/S
21. WO2021110827 (A1) "A METHOD OF MANUFACTURING A COMPOSITE COMPONENT WITH VARYING ELECTRIC RESISTIVITY ALONG A LONGITUDINAL DIRECTION" GRUNDFOS HOLDING A/S
22. WO2021110826 (A1) "A HEATING SYSTEM AND METHOD OF MANUFACTURING A HEATING SYSTEM" GRUNDFOS HOLDING A/S
23. WO2021110811 (A1) "ENDOTHERMIC REACTION OF A FEED GAS HEATED BY RESISTANCE HEATING" TOPSOE HALDOR A/S, GRUNDFOS HOLDING A/S
24. WO2021110810 (A1) "ENDOTHERMIC REACTION OF A FEED GAS HEATED BY RESISTANCE HEATING" TOPSOE HALDOR A/S, GRUNDFOS HOLDING A/S