Teaching portfolio

1. Teaching CV: A list of teaching and supervision tasks, including specification of academic fields, scope, level (bachelor, master, continuing education, PhD). Please state the teaching method used (e.g. lecture, class teaching, exercises, supervision, examination, coexamination, distance teaching, internet-based teaching and evaluation of teaching). Please also indicate the language of instruction.

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Courses/Lectures (BSc+MSc level)

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2023 – EE5/MCE5 – “Power Electronics” – 5 ECTS, 3 lectures + exercises, examination
2022 – EE5/MCE5 – “Power Electronics” – 5 ECTS, 3 lectures + exercises, examination
2021 – EE5/MCE5 – “Power Electronics” – 5 ECTS, 3 lectures + exercises, examination
2020 – EE5/MCE5 – “Power Electronics” – 5 ECTS, 3 lectures + exercises, examination
2017 – EE5/MCE5 – “Power Electronics” – 5 ECTS, Teaching assistant for 6 lectures + exercises

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Courses/Lectures (PhD level)

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2019 – PhD – “Power module design, packaging and testing”, 1.5 hour lecture – “INTEGRATED POWER MODULE PACKAGING”
2018 – PhD – “Multiphysics Simulation and Design of Power Electronics”, 1.5 hour lecture – “ANSYS Q3D EXTRACTOR WORKSHOP”

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Supervision (BSc+MSc level)

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2022 – Co-supervisor- PED3-924 - "Modify Modular Multilevel Converter Cells towards an DC Circuit Breaker", Jakob Jacobsen
2022 – Main supervisor - EN1-108 - "V2H For En Almindelig Husstand", Nikolaj Kjægaard Andersen, Andreas Bundgaard Husted, Niels Kjærgaard, Rasmus Dam Nielsen
2022 – Main supervisor - EE6-612 - "GaN DC-DC buck-boost on-board converter for EV", Jeppe Vilsøe Jensen, Nikolaj Kristensen, Jakob Deichgraeber, Kerim Brackovic
2022 – Co-supervisor - PED4-1040 - "Design and experimental implementation of 3.6 KW bridgeless Totem-pole PFC converter for welding machines", Gansheng Huang
2021 – Co-supervisor - PED3-941 - "3.6 kW bridgeless PFC", Frederik Brath Severinsen, Gansheng Huang
2021 – Main supervisor - EN1-B143 - "Pumped Storage Hydropower i Danmark", Mads Nedergaard Andersen, Tobias Dahl Steensen, Rasmus Terp Jensen, Marie-Louise Eske Jensen
2021 – Main supervisor - EN1-B142 - "Ellagring i et fremtidigt dansk elnet", Nicolai Guldager, Lucas Haals Burchardt, Tobias Arnfeld Sparre, Rasmus Rose-Hansen, Frida Lyngholm Andersen
2021 – Co-supervisor - PED4-1041 - "Control of Converter Switching Waveforms", Pawel Piotr Kubulus
2021 – Co-supervisor - PED4-1048 - "Class-E Push-Pull Resonance Converter", Janus Dybdahl Meinert, Benjamin Futtrup Kjærsgaard
2021 – Co-supervisor - PED4-1046 - "Design and Optimisation of a Half-Bridge Switching Module With Parallel GaN HEMTs for High Power Applications Using Finite-Element Analysis", Mike Robin Zäch, Sigmundur Í Garði, Simon Holt Olsen
2020 – Co-supervisor - PED3-943 - "Digital Design and Optimisation of a Bridgeless Totem-Pole PFC Converter Using Finite-Element Analysis", Mike Robin Zäch, Sigmundur Í Garði, Simon Holt Olsen
2020 – Co-supervisor – PED4-1045 – “Analysis and Design of a Novel Multicell approach to DC/AC Inverter”, Faheem Ahmad

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Supervision (PhD level)

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Co-supervisor Mike Robin Zäch “Power Density Optimization of High Efficiency Wide-Band Gap Semiconductor Power Modules using Digital Design” (2022-2025)
Co-supervisor Masaki Takahashi “Developing Reliability Design Method with 3D-simulation of SiC MOSFET Power Module” (2021-2024)
Co-supervisor Zhongchao Sun “Digital design-based and data-driven combined power electronics packaging reliability analysis method” (2021-2024)
Co-supervisor Pawel Kubulus “Digital Twin Based Automated Design for Converters Incorporating Wide-Band Gap Devices” (2021-2024)
Co-supervisor Janus Meinert “Conducted and radiated noise emissions in fast-switching WBG systems” (2021-2024)
Co-supervisor Rui Wang “Series-connection of SiC MOSFET devices using a single self-driven gate driver” (2020-2023)
Co-supervisor Faheem Ahmad “Transistorization of Industrial Dielectric Heating Plants” (2020-2023)
Co-supervisor Hongbo Zhao “Modeling and Reducing the Parasitic Capacitance in Medium-Voltage Inductors” (2018-2021)

2. Study/programme administration and management: Experience in programme management and coordination. A list of study administration tasks, e.g. study board membership, chair of study board, semester or course coordinator, accreditation tasks, etc. Experience in planning teaching activities. Experience in programme development. Participating in committees and commissions etc. on education issues.

2023 – Course-coordinator - EE5/MCE5 – “Power Electronics” – 5 ECTS
2022 – Course-coordinator - EE5/MCE5 – “Power Electronics” – 5 ECTS
2021 – Course-coordinator - EE5/MCE5 – “Power Electronics” – 5 ECTS

3. Formal pedagogical training: A list of completed courses in university pedagogy, PBL courses, workshops, academic development projects, collegial guidance and supervision, etc. Written assessment from the course in university pedagogy for assistant professors. Participation in conferences on pedagogy and didactics. Please enclose any documentation of the above, such as course certificates, references, etc

2022 University pedagogical programme at Aalborg University
Supervisors: Henrik Clemmensen Pedersen, Aida Olivia Pereira de Carvalho Guerra
Report “The dynamic role as supervisor at a problem based learning university” – 10 pages
Courses (Compulsory/Mandatory)
18-01-2022: Module 1: Teaching at a PBL university (1 of 2)
10-02-2022: Module 1: Teaching at a PBL university (2 of 2)
03-03-2022: Module 2: Planning and Implementation of Group Instruction (1 of 2)
25-03-2022: Module 2: Planning and Implementation of Group Instruction (2 of 2)
28-03-2022: Module 3: The Use of IT and Media for Learning and Teaching (1 of 2)
20-06-2022: Module 3: The Use of IT and Media for Learning and Teaching (2 of 2)
30-03-2022: Module 4: PBL Group (1 of 2)
26-04-2022: Module 4: PBL Group (2 of 2)
10-05-2022: Module 5: Planning, Development and Quality assurance (1 of 1)
Courses (Electives)
12-10-2022 Research integration
13-10-2022 Group examination – Understanding the complex role of the examiner
10-11-2022 PBL in Engineering and Science
30-11-2022 Facilitating student activity
From the evaluation report of 2022 University pedagogy course at Aalborg University, supervisors Henrik Clemmensen Pedersen and Aida Olivia Pereira de Carvalho Guerra have given the following statement as evaluation of my teaching and supervision:
According to the University Pedagogy framework of provisions, Asger fulfilled the objectives set for the project report. He identified and addressed a self-chosen challenge. His challenge was addressed through the following questions: (i) Do problems that students face during their studies change over time, and how does it impact the supervision that they should be provided? (ii) What are some approaches and methods that the supervisor can use, to better comprehend the dynamics of supervision during the time from first to tenth semester?
Asger reflected on his supervision style by relating his reflections with style descriptions provided by literature. This was followed by students' feedback on how they experienced Asger's supervision, providing Asger additional inputs for reflection and adjustment of his practice. From a developmental perspective, the approach documented in this report can be used by him in future supervision sessions enabling him to better adjust to students' needs and contribute to better learning experiences and outputs. In the future, Asger could also consider taking this exercise as part of the first supervision meeting as well, especially in higher semesters, where students have previous experiences. This would enable, for example, to align expectations between students and supervisor as well as to provide input to the supervisor about the type of group and students he has in front of him, thus enabling a more adjusted supervision for a given group.
Summary statement
Based on the observations and supervisor meetings, it is clear that Asger is a very well-prepared and enthusiastic teacher who pays attention to the students and the learning environment. Furthermore, he firmly holds the ability to teach fundamental engineering disciplines in a PBL context with a good reflection of his own practice and in which directions to move for further improvement and development.
Given the above, we consider that Asger fulfills all the requirements and successfully passes the university pedagogy course for assistant professors.

4. Other qualifications: Conference contributions and attendance, contributions to debates, scientific articles on pedagogical issues etc. Peer supervision, editorials, mentoring experience or other types of competence development activities.

Type your answer here...

5. Pedagogical development and research: Development of new courses, teaching materials, teaching methods, examination types or other types of pedagogical development. Didactic and pedagogical research. Cooperation with external collaboration partners.

Electrical engineering students are introduced to the topics of power electronics and switch mode power supplies through the derivation of the simple second order DC-DC converter topologies such as the buck, boost and buck-boost. The operation of such converters is described in detail and the governing equations are derived step by step in various text books and freely available online sources. However, there is a steep learning curve in open access knowledge when it comes to expanding this knowledge further to fourth order DC-DC converter types such as the Cuk, Zeta and Single-Ended Primary-Inductor Converter (SEPIC) topologies.
The purpose of publishing the following open access papers is to guide engineering students and ease their transition from the most basic DC-DC converter topologies to more advanced types:
A. B. Jørgensen "Derivation, Design and Simulation of the Single-Ended Primary-Inductor Converter (SEPIC)", 2019, engrXiv URL: https://engrxiv.org/preprint/view/494/
A. B. Jørgensen "Derivation, Design and Simulation of the Zeta converter", 2021, TechXiv URL: https://www.techrxiv.org/articles/preprint/Derivation_Design_and_Simulation_of_the_Zeta_converter/16732825
I also frequently use the papers as self-study for students in semester projects, for them to work through the analysis in their own pace step-by-step.

6. References on your teaching skills from superiors or colleagues. Teaching evaluations and any teaching awards received.

7. Personal reflections and initiatives: Here you may state any personal deliberations as regards teaching and supervision, any wishes and plans for further pedagogical development, plans for following up on student feedback/evaluations, etc. Personal reflections on your own pedagogical practice, including objectives, methods and implementation. This should include an analysis and a reasoned description of your pedagogical activities in relation to your pedagogical understanding and student learning. Thoughts on the teaching method at Aalborg University (which is largely based on group-organised project work and problem-based learning)

Type your answer here...

8. Any other information or comments.

Type your answer here...