

Curriculum Vitae

Brian Elmegaard

Business Address:

Technical University of Denmark
Department of Mechanical Engineering
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Experience

Current Employment

Associate Professor at Department of Mechanical Engineering, Technical University of Denmark, since July 2002

Section leader of the group Thermal Energy Engineering, Department of Mechanical Engineering, Technical University of Denmark, since October 2007

Research: Modelling of biomass-fired boilers for control system development, Biomass Fired Gas Turbines, Compressed Air Energy Storage, Simulation Software Development, Fuel Cell Systems, Refrigeration systems.

References Professor Henrik Carlsen, Associate Professor Niels Houbak

Assistant Professor at Department of Mechanical Engineering, Technical University of Denmark, From December 2001–June 2002

Research: Indirectly Biomass Fired Gas Turbines, Simulation Software Development

Reference Professor Bjørn Qvale.

Head of Research of Nordic Energy Research Programme for Process Integration, January 2000 – December 2000

References Professor Bjørn Qvale, Professor Carl-Johan Fogelholm, Helsinki University of Technology

Research Assistant Professor at Department of Energy Engineering, Technical University of Denmark, January 2000 – December 2000

Research: Indirectly Biomass Fired Gas Turbines, Simulation Software Development

References Professor Bjørn Qvale

Research Assistant at Department of Energy Engineering, Technical University of Denmark, May 1999– December 1999

Research: Indirectly Biomass Fired Gas Turbines, Simulation Software Development

References Professor Bjørn Qvale

Part time engineer employment at Burmeister & Wain Scandinavian Contractor, DK-3400 Allerød, 1994-1995. Work on biogas plant design and exhaust gas flow experiments

References Lars Ellegaard

Part time engineer employment at Bengårds Eftf. Tools Manufactory, 1990-2001

Work in progress

Research on Development of simulation software for biomass-fired boilers.

Research on Compressed Air energy Storage

Research on Biomass Fired Gas Turbines

Development of the Energy System Simulation Software, DNA

Supervision of Master Thesis Projects and undergraduate students projects

Degrees

Ph.D. degree from Technical University of Denmark, March 1996– April 1999.

Thesis: Simulation of Boiler Dynamics — Development, Evaluation and Application of a General Energy System Simulation Tool

External stay during the Ph.D. Study at Delft University of Technology, The Netherlands. August 1997-January 1998

Research: Power Plant Boiler Dynamics, Biomass Fired IGCC, Simulation Software Development

Other activities: Lecturing, Project Supervision, Unix Network Administration

References Associate Professor Niels Houbak, Ir. Arie Korving, Delft University of Technology.

M.Sc. in Engineering from Technical University of Denmark, September 1993-February 1996.

Thesis: Modelling of Dynamics of the Avedøreværket Unit 1 with the simulation tool DNA.

B.Sc. in Engineering from Engineering College of Copenhagen, August 1989–June 1993.

Thesis: Analysis of Smell Problems at Biogas Plants

Machinist and metalworker training at Sauerbergs Maskinfabrik, Tårnby January 1989 – June 1989

Machinist and metalworker training at Maskinindustriens Fagskole, Ballerup August 1988– December 1988

High School Exam at Tårnby Gymnasium 1988

Teaching Experience

Organization of the Ph. D. Course: Introduction to Object-Oriented Modelling with Modelica at Technical University of Denmark, September 2004.

Organization and lecturing of the Ph. D. Course: Modelling and Simulation of Energy Systems and Process Plants at Technical University of Denmark, September 2000.

Organization and lecturing of the course: Simulation of Energy systems at Technical University of Denmark, 2000–2005. Course responsible 2004–2005.

Supervision of 25 M. Sc. projects, Technical University of Denmark, 1997-2006

Lectures in courses: Sustainable Production, Gas turbines in Power Plants, Energy Systems, Thermal Power Plants, Fuel Cell systems, Technical University of Denmark, 1998 to 2005

Publications

Theses

- B. Elmegaard, *Modellering af dynamiske forhold på AVV1 med DNA*, ET-EP-96-14, Department of Energy Engineering, Technical University of Denmark, 1996
- B. Elmegaard, *Simulation of Boiler Dynamics – Development, Evaluation and Application of a General Energy System Simulation Tool*, Department of Energy Engineering, Technical University of Denmark, 1999

Papers in Refereed Journals

- Elmegaard, B., Henriksen, U. B., Qvale, E. B. (2003) *Thermodynamic Analysis of Supplementary-Fired Gas Turbine Cycles*, International Journal of Applied Thermodynamics, Vol. 6
- Bianchi, M., Cherubini, F., Elmegaard, Brian, Pascale, A. D., Peretto, A. (2006) *Cogeneration from Poultry Industry Wastes*, Accepted for Energy, vol 31, 10-11
- Petersen, Thomas F., Houbak, Niels, Elmegaard, Brian (2006), *A zero-dimensional model of a 2nd generation planar SOFC using calibrated parameters*, International Journal of Thermodynamics, vol 9, 4
- Elmegaard, B., Sporning, J., Erleben, K., Sørensen, K. (2006) *Preface of Special Issue of Simulation Modeling Practice and Theory*, Simulation Modeling Practice and Theory, vol 14, 8
- Houbak, N.; Elmegaard, B.; Qvale, B.; Moran, M.J. (2006) *Editorial Introduction*, Energy, vol 31, 10-11

Papers at Refereed Conferences

- Brian Elmegaard, Niels Houbak *DNA – A General Energy System Simulation Tool*, SIMS 2005, Trondheim, Norway, 2005
- Thomas Frank Petersen, Niels Houbak, Brian Elmegaard *Development of a zero dimensional model of a 2nd generation planar SOFC with empirical calibration of electrochemical parameters*, ECOS 2005, Trondheim, Norway, 2005
- Brian Elmegaard, Nicklas Szameitat and Wiebke Brix *Compressed Air Energy Storage (CAES) - possibilities in Denmark*, ECOS 2005, Trondheim, Norway, 2005
- Elmegaard. B, Qvale. B (2004) *Regenerative Gas Turbines with Divided Expansion*, ASME IGTI Turbo Expo 2004, Vienna, Austria, 2004
- Ilsøe, J., Kristensen, K. T., Elmegaard B., Qvale B., Dalsgård H. (2004) *Modeling of Refrigeration Plants with Heat-Recovery System*, in Proceedings of ECOS 2004 1279–1292

- Peretto, A., Bianchi, M., Cherubini, F., Pascale, A. D., Elmegaard, B. (2003) *Cogeneration from Poultry Industry Wastes – Part I: Indirectly Fired Gas Turbine Application*, In: Niels Houbak et al, (eds.), Proceedings of ECOS 2003, Copenhagen, June 30-July 2, 2003, Technical University of Denmark, 145-152
- Bianchi, M., Cherubini, F., Pascale, A. D., Peretto, A., Elmegaard, B. (2003) *Cogeneration from Poultry Industry Wastes – Part II: Economic Analysis*, In: Niels Houbak et al. Proceedings of ECOS 2003, Copenhagen, June 30-July 2, 2003, Technical University of Denmark, 153-160
- Andersen, L., Elmegaard, B., Henriksen, U. B., Qvale, E. B. (2003) *Modelling the Low-Tar Big Gasification Concept*, In: Niels Houbak et al. (eds.), Proceedings of ECOS 2003, Copenhagen, Denmark, June 30-July 2, 2003, Technical University of Denmark, vol.2, 1073-1079
- Elmegaard, B., Houbak, N. (2003) *Simulation of the Avedøreværket Unit 1 Cogeneration Plant with DNA*, In: Houbak, N. et al. Proceedings of ECOS 2003, Copenhagen, Denmark, June 30 - July 2, 2003, Technical University of Denmark, 8 pages (1659-1666)
- Elmegaard, B. (2003) *Robustness of Component Models in Energy System Simulators*, In: Dahlquist, E. (ed.), Proceedings of SIMS 2003, Västerås, Sweden, September 18-19, 2003, Mälardalens Högskola, Sweden, 213-219
- B. Elmegaard, A. Jakobsen *Approaches to Energy System Modeling*, SIMS 2002, Oulu, Finland, 2002
- B. Elmegaard, N. Houbak *Software for the Simulation of Power Plant Processes – Part A*, ECOS 2002, Berlin, 2002
- B. Elmegaard, N. Houbak *Software for the Simulation of Power Plant Processes – Part B*, ECOS 2002, Berlin, 2002
- B. Elmegaard, U. Henriksen, B. Qvale *Thermodynamic Analysis of Supplementary-Fired Gas Turbine Cycles*, ECOS 2002, Berlin, 2002
- B. Elmegaard, B. Qvale, *Analysis of Indirectly Fired Gas Turbine for Wet Biomass Fuels Based on commercial micro gas turbine data*, ASME IGTI Turbo Expo 2002, Amsterdam, The Netherlands, 2002
- B. Elmegaard, N. Houbak, *Handling Discontinuities in Dynamic Simulation of Energy Systems*, ECOS '01, Istanbul, Turkey, 2001
- B. Elmegaard, B. Qvale, G. Carapelli, P. de Faveri Tron, *Open-cycle Indirectly Fired Gas Turbine for Wet Biomass Fuels*, ECOS '01, Istanbul, Turkey, 2001
- J. D. Bentzen, R. Hummelshøj, U. Henriksen, B. Elmegaard, *Low Tar and High Efficient Gasification Concept*, ECOS 2000, Enschede, The Netherlands, 2000
- B. Elmegaard, N. Houbak, *Robust Implementation of Process Simulators and Their Associated Models*, ECOS 2000, Enschede, The Netherlands, 2000
- B. Elmegaard, N. Houbak, *On the Implementation of Energy System Simulators with Emphasis on Chemical Equilibrium Gasifier Models*, ECOS'99, Tokyo, Japan, 1999
- B. Elmegaard, A. Korving, *Analysis of a Biomass based Integrated Gasification/Combined Cycle Plant*, ECOS'98, Nancy, France, 1998
- B. Elmegaard, N. Houbak, B. Lorentzen, *DNA - a Network-based Energy System Simulator*, FLOWERS'97, Florence, Italy, 1997

Lecture Notes

- Brian Elmegaard, *ODEs with invariants*, in P. G. Thomsen, C. Bendtsen, *Numerical Solution of Differential Algebraic Equations*, Department of Mathematical Modelling, Technical University of Denmark, 1999
- Brian Elmegaard, *DAEs in Energy Systems*, in P. G. Thomsen, C. Bendtsen, *Numerical Solution of Differential Algebraic Equations*, Department of Mathematical Modelling, Technical University of Denmark, 1999
- Brian Elmegaard, *The Engineer's DNA by Example*, Department of Energy Engineering, Technical University of Denmark, 2000–2005
- Brian Elmegaard, *An algorithm for pinch analysis*, Department of Energy Engineering, Technical University of Denmark, 2005

Technical Reports

- Brian Elmegaard og Bjørn Qvale, *Indirekte Biomassefyret Gasturbine*, MEK-ET-2002-01. 55 pages.
- Brian Elmegaard og Bjørn Qvale, *Indirekte Biomassefyret Gasturbine – Integregation med udvalgte industrielle processer*, MEK-ET-2002-02.
- Brian Elmegaard, *ECOS 2003 proceedings software*, Department of Energy Engineering, Technical University of Denmark, 2003

Editorial Work

- Elmegaard, B., Sporning, J., Erleben, K. Sørensen, K. (2006) *Special Issue of SIMPRA – Simulation and Modelling Practice and Theory*, Elsevier, 2006.
- Houbak, N., Elmegaard, B., Qvale, B., Moran, M. J. (2006) *Special Issue of Energy – the International Journal*, Elsevier, 2006.
- SIMPRA – Simulation Modelling Practice and Theory, Elsevier International Journal, Area Editor and Reviewer
- Energy - The international Journal, Elsevier International Journal, Reviewer
- Applied Thermal Engineering, Elsevier International Journal, Reviewer
- International Journal of Thermodynamics, International Journal, Reviewer
- Elmegaard, B., Sporning, J., Erleben, K. Sørensen, K. (2004) *Proceedings of SIMS 2004*, Institut for Mekanik, Energi og Konstruktion, Technical University of Denmark, 452 pp.
- Houbak, N., Elmegaard, B., Qvale, E. B., Moran, M. (2003) *Proceedings of the 16th International ECOS conference. Volume 1, 2, and 3*, Institut for Mekanik, Energi og Konstruktion, Technical University of Denmark, 1783 pp.
- Brian Elmegaard (Editor), *Notes for Modelling and Simulation of Energy Systems and Process Plants*, Nordic Energy Research Programme, 2000
- Arne Jakobsen et al., *Proceedings of SIMS 2000*, Technical University of Denmark, 2000
- Brian Elmegaard and Bjørn Qvale, *Proceedings of Process Integration in the Design of Energy Systems*, Nordic Energy Research Program, 2000
- Annual report of Nordic Energy Research Program for Process Integration, 2000
- PI-nytt volume 5, 2000, newsletter of Nordic Energy Research Program for Process Integration

Invited Seminars

- Presentation *Danish Research in Process Integration*, Nordic-Baltic workshop on Process Integration, Vilnius, Lithuania, June 2000
Presentation *Introduktion til MetaPost*, Aalborg University, DK-TUG seminar, March 2001

Posters at International Conferences

- J. D. Bentzen, R. Hummelshøj, U. Henriksen, B. Elmegaard, *Medium and large scale low tar and high efficient gasification*, Seville, 2000

Memberships

- Member of Engineering Association of Denmark, IDA
Chairman of Danish Simulation Society, DKSIM, since 2001
Member of the Board of Scandinavian simulation Society, SIMS, since 2001
Member of Danish T_EX User Group, DK-TUG

Honors

- At the graduation from Engineering College of Copenhagen, I was awarded the best exam of the year.

Conference Organization

- SIMS 2000, Technical University of Denmark. Organizer and Reviewer
SIMS '01, Porsgrunn Norway. Reviewer.
SIMS 2002, University of Oulu, Finland. Member of Scientific Committee and reviewer
ECOS 2002, Technical University Berlin. Reviewer
ECOS 2003, Technical University of Denmark and University of Copenhagen. Organizer and member of Scientific Committee
SIMS 2003, Mälardalen University, Sweden. Member of Scientific Committee and reviewer
SIMS 2004, Technical University of Denmark. Chair of Scientific and Organizing Committees and reviewer
SIMS 2005, NTNU, Trondheim, Norway. Member of Scientific Committee and reviewer
SIMS 2006, Helsinki, Finland. Member of Scientific Committee and reviewer
SIMS 2007, Gothenburg, Sweden. Member of Scientific Committee and reviewer

Personal information

- Born 17. April 1970 in Copenhagen
Married to Karen 1996
Two daughters born 1993 og 1995