

Essam Elgendy

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Faculty of Engineering at El-Mattaria
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Personal

Born on November 10, 1973.

Married, two Sons and one Girl.

Education

B. S. Mechanical Power Engineering, Faculty of Engineering at El-Mattaria, Helwan University, Egypt 1996.

M. Sc. Mechanical Power Engineering, Faculty of Engineering at El-Mattaria, Helwan University, Egypt 2001.

Ph. D. Faculty of Process and System Engineering, Otto-von-Guericke University, Magdeburg, Germany, 2011, Analysis of energy efficiency of gas driven heat pumps (Grade Excellent).

Employment

Assistant Researcher, (1998-2001) Mechanical Power Engineering, Faculty of Engineering at El-Mattaria, Helwan University.

Lecturer Assistant, (2002-2011) Mechanical Power Engineering, Faculty of Engineering at El-Mattaria, Helwan University.

Assistant Professor, (2011- 2015) Mechanical Power Engineering, Faculty of Engineering at El-Mattaria, Helwan University.

Assistant Professor, (2015- 2016) Mechanical Engineering (Mechatronics), College of Engineering & Technology, Arab Academy for Science and Technology.

Scientific Missions

Ph. d, Faculty of Process and System Engineering, Otto-von-Guericke University, Magdeburg, Germany, 2008- 2011.

Post- Doctor (Solar Cooling), Faculty of Process and System Engineering, Otto-von-Guericke University, Magdeburg, Germany, 2013- 2014.

Journals Reviewer

International Journal of Refrigeration (Published by Elsevier). Applied thermal engineering (Published by Elsevier). International Journal of Green Energy Energy (Published by Elsevier).

Congress Review

World Renewable Energy Congress 2011 - 8-11 May 2011, Linköping, Sweden.

Theses Supervision

Completed Theses

- 1- **Master Thesis** "Analysis of Operational Behavior of a Micro Combined Heating, Cooling and Power Plant" Faculty of Process and System Engineering, Otto-von-Guericke University, Magdeburg, Germany, April 2010.
- 2- **Diploma Thesis** "Energetische Analyse einer Gasmotor Wärmepumpe mit Kälte Wärme Kopplung unter winterlichen Betriebsbedingungen" Faculty of Process and System Engineering, Otto-von-Guericke University, Magdeburg, Germany, July 2012.
- 3- **Master Engineering** "Capillary Tube Selection for R502 Alternatives" Faculty of Engineering at Mattaria, Helwan University, Egypt, 2013.
- 4- **Master of Science** "Thermo-economical Analysis of a Vapour Jet Refrigeration System" Faculty of Engineering at Mattaria, Helwan University, Egypt, 2013.
- 5- **Master of Science** "Performance Evaluation of a Residential Air Conditioner working with Ozone Friendly Refrigerants" Faculty of Engineering at Mattaria, Helwan University, Egypt, 2013.
- 6- **Master of Science** "Condensation characteristics of ozone safe refrigerant inside horizontal micro-fin tubes" Faculty of Engineering at Mattaria, Helwan University, Egypt, 2013.
- 7- **Ph. D. Thesis** "Thermo-economical Analysis of desiccant evaporative cooling system" Faculty of Engineering at El-Mattaria, Helwan University, Egypt, 2015.
- 8- **Master of Science Thesis** "Performance Evaluation of a Direct Expansion Air Conditioning System Working With R22 Alternatives" Faculty of Engineering at El-Mattaria, Helwan University, Egypt, 2015.
- 9- **Master of Science Thesis** "Improvement of a Vapor Compression Refrigeration System Performance Using a Two Phase Ejector as an Expansion Device" Faculty of Engineering at El-Mattaria, Helwan University, Egypt, 2015.

Current Theses

- 1- **Master Thesis** "Performance of centrifugal chiller" Faculty of Engineering at El-Mattaria, Helwan University, Egypt, 2012.
- 2- **Master Thesis** "Performance of a Desalination system driven by renewable energy" Faculty of Engineering at El-Mattaria, Helwan University, Egypt, 2012.
- 3- **Master Thesis** "Solar assisted air conditioning system in residential buildings", Faculty of Engineering at El-Mattaria, Helwan University, Egypt, 2012.
- 4- **Master Thesis** "Thermo-Economic Analysis Of Solar Powered Refrigeration Systems Under Egyptian Climatic Conditions" Faculty of Engineering at El-Mattaria, Helwan University, Egypt, 2015.

International Collaborative Projects

- Member in work packages (8 and 9) of "Multipurpose Applications by Thermodynamic Solar (MATS)" Project, which is funded by European Commission under FP7 grant agreement number 268219, collaborative countries (Egypt, Italy, Germany, France and England), 2011-2013.
- Principle Investigator of "Optimization of GHP Applications for Cooling and Heating by Trigeration" Project, collaborative countries (Egypt and Germany), 2012-2014, IP4343.
- CO-PI of "Cold store driven by solar energy" Project, Supported by STDF, 2016-2018.

Publications

Journal Articles

- 1- Fatouh, M., Nabil, M. and **Elgendy, E.**, "Performance of a vapor compression heat pump using R134a for cooling and heating applications", Engineering Research Journal, Helwan University, Faculty of Eng., Mattarria, Cairo, Egypt, 2002.
- 2- Khalil, A., Fatouh, M. and **Elgendy, E.**, "Ejector design and simulation of a vapor jet refrigeration system working with R134a", Engineering Research Journal, Helwan University, Faculty of Eng., Mattarria, Cairo, Egypt, 2007.
- 3- **Elgendy, E.**, Schmidt, J., "Experimental study of gas engine driven air to water heat pump in cooling mode", Energy 2010; 35(6); 2461-2467.
- 4- **Elgendy, E.**, Schmidt, J., "Experimental investigation of gas engine heat pump in cooling mode", Online Journal on Power and Energy Engineering 2010; 1(3); 88-96.
- 5- **Elgendy, E.**, Schmidt, J., Khalil A., Fatouh, M., "Performance of a gas engine heat pump using R410A for heating and cooling applications", Energy 2010; 35(12); 4941-4948.
- 6- **Elgendy, E.**, Schmidt, J., Khalil, A., Fatouh, M., "Performance of a gas engine driven heat pump for hot water supply systems", Energy 2011, 36(5); 2883-2889.
- 7- Fatouh, M., **Elgendy, E.**, "Experimental investigation of a vapor compression heat pump used for cooling and heating applications", Energy 2011, 36(5); 2788-2795.
- 8- Khalil, A., Fatouh, M., **Elgendy, E.**, "Ejector design and simulation of a vapor jet refrigeration system working with R134a", International Journal of Refrigeration 2011; 34(7); 1684-1698.

- 9- **Elgendy, E.**, Schmidt, J., Khalil, A., Fatouh, M., "Modelling and validation of a gas engine heat pump working with R410A for cooling applications", *Applied Energy* 2011, 88(12);4980-4988.
- 10- M. Abd El Monem, **Elgendy, E.**, Fatouh, M., "Waste Heat Driven Vapor Jet Refrigeration System used for Air Conditioning Applications", *Online Journal on Power and Energy Engineering* 2013, 1(3); 205-217.
- 11- **Elgendy, E.**, Schmidt, J., "Rating Charts of R-22 Alternatives Flow through Adiabatic Capillary Tubes", *International Journal of Mechanical Engineering* 2013, 7(8);58-65.
- 12- **Elgendy, E.**, "Parametric Study of a Vapor Compression Refrigeration Cycle Using a Two-Phase Constant Area Ejector", *International Journal of Mechanical Engineering* 2013, 7(8); 66-72.
- 13- **Elgendy, E.**, Schmidt, J., "Performance Comparison of Water to Water and Air to Water Gas Engine Heat Pumps Used for Cooling and Heating Applications", *Engineering Research Journal*, Helwan University, Faculty of Eng., Mattarria, Cairo, Egypt, 2013.
- 14- **Elgendy, E.**, Schmidt J., "Optimum utilization of recovered heat of a gas engine heat pump used for water heating at low air temperature", *Energy and Buildings* 2014, 375–383.
- 15- **Elgendy, E.**, Hassanain, M., Fatouh, M., "Assessment of R-438A as a retrofit refrigerant for R-22 in direct expansion water chiller", *International Journal of Refrigeration* 2014, 50, 127-136.
- 16- **Elgendy, E.**, Mostafa A., Fatouh, M., "Performance enhancement of a desiccant evaporative cooling system using direct/indirect evaporative cooler", *International Journal of Refrigeration* 2015, 51, 77-78.
- 17- Hassanain, M., **Elgendy, E.**, Fatouh M., "Ejector expansion refrigeration system: ejector design and performance evaluation", *International Journal of Refrigeration* 2015, 58, 1-13.

Proceedings

- 1- Fatouh M., Nabil, M. and **Elgendy, E.**, "Exergy analysis of a vapor compression heat pump working with R12 alternatives", 8th International conference on Aerospace Science and Aviation Technology, Military Technical College, 4-6 May, 1999, Cairo, Egypt, Vol. 1, pp. 457-471.
- 2- **Elgendy, E.**, Schmidt, J., "Experimental investigation of gas engine heat pump in cooling mode", The 2009 World Congress on Power and Energy Engineering WCPEE.09, 5-8 October, 2009, Cairo, Egypt.
- 3- Boye, H., Scheffel, F., **Elgendy, E.** and Schmidt J., "Energieeffizienter Betrieb von Gasmotorwärmepumpen", *Deutsche Kälte-Klima-Tagung 2010 Magdeburg*, 17-19 November, 2010, Magdeburg, Germany.
- 4- **Elgendy, E.**, Schmidt, J., Khalil A., Fatouh M., "Experimental Performance of a Combined Heating and Cooling System Driven by Gas Engine", Tenth International Congress of Fluid Dynamics ASME-ICFD10, December 16-19, 2010, Cairo, Egypt.
- 5- **Elgendy, E.**, Schmidt, J., Khalil A., Fatouh M., "Modelling and Validation of Scroll Refrigeration Compressor", Tenth International Congress of Fluid Dynamics ASME-ICFD10, December 16-19, 2010, Cairo, Egypt.

6- **Elgandy, E.**, G. Boye, Schmidt J., Khalil A., Fatouh M., "Experimental Evaluation of a Gas Engine Driven Heat Pump Incorporated with Heat Recovery Subsystems for Water Heating Applications", World Renewable Energy Congress 2011 - Sweden.

7- **Elgandy, E.**, Hassanein, M., "Energy and exergy analysis of an ejector expansion refrigeration cycle using R404a as working fluid", Eleventh International Congress of Fluid Dynamics ICFD11, December 19-21, 2013, Alexandria, Egypt.

8- Mostafa, A., **Elgandy, E.**, Fatouh M., "Performance of a novel desiccant evaporative cooling system under climatic conditions of coastal Egyptian cities", Eleventh International Congress of Fluid Dynamics ICFD11, December 19-21, 2013, Alexandria, Egypt.

9- Gendy, R., **Elgandy, E.**, Mahmoud, H., Helali, A.B., "Experimental Evaluation of Condensation Heat Transfer Coefficient of R-417A in Horizontal Tubes", 17th International Conference on APPLIED MECHANICS & MECHANICAL ENGINEERING, April 19-21, 2016, Military Technical College Kobry Elkobbah, Cairo, Egypt.

10- Nawar, M. A., **Elgandy, E.**, Mostafa, A., "DESIGN OF A COMBINED COOLING AND HEATING SYSTEM DRIVEN BY A BACK PRESSURE STEAM TURBINE IN BORG EL-ARAB ", 17th International Conference on APPLIED MECHANICS & MECHANICAL ENGINEERING, April 19-21, 2016, Military Technical College Kobry Elkobbah, Cairo, Egypt.

International Books

Elgandy, E., Schmidt, J., Khalil, A., Fatouh, M., Energy efficiency of a gas engine heat pump used in water cooling and heating applications, In Book Energy Efficient of water Heating Systems, Nova Science.

Teaching Skills

- 1- Refrigeration and Air Conditioning (1998- now)
- 2- Cooling and Heating Loads Estimation (2012-2015)
- 3- Heat Pumps (2012)
- 4- Performance and Economics of Refrigeration and Air Conditioning System (2011- 2015)
- 5- Heat Transfer (1998-2012)
- 6- Advanced Thermodynamic (2000-2012)
- 7- Duct Design (2012)
- 8- Refrigeration and Air Conditioning Systems Maintenance (2015)
- 9- Thermal Systems Programming using EES (Engineering equation solver) (2013- 2015)
- 10- Solar Cooling Systems (2015).
- 11- Thermodynamic-I and Thermodynamic-II (2015-2016).
- 12- Fluid Mechanics (2015-2016).

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Article Excerpt

According to a study from Magdeburg, Germany, "Nowadays a sustainable development for more efficient use of energy and protection of the environment is of increasing importance. Gas engine heat pumps represent one of the most practicable solutions which offer high energy efficiency and environmentally friendly for heating and cooling..."

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Energy Research

Study data from E. Elgendy and co-authors update knowledge of energy research

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Energy Research

Study Data from Otto Von Guericke University Update Knowledge of Energy Research

July 15th, 2011

According to the authors of a study from Magdeburg, Germany, "The present work aimed at evaluating the experimental performance of a gas engine heat pump for hot water supply. In order to achieve this

objective, a test facility was developed and experiments were performed over a wide range of ambient air temperature (10.9-25.3 degrees C), condenser water inlet temperature (33-49 degrees C) and at two engine speeds (1300 and 1750 rpm)."

"Performance characteristics of the gas engine heat pump were characterized by water outlet temperatures, total heating capacity and primary energy ratio. The reported results revealed that hot water outlet temperature between 35 and 70...

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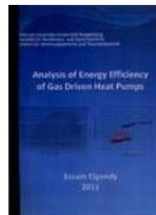
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Dr.-Ing. Essam Elgenny

Titel der Dissertation

Analysis of Energy Efficiency of Gas Driven Heat Pumps



Verteidigung am

28.07.2011,
Otto-von-Guericke-Universität Magdeburg

Gutachter

- ▶ Prof. Dr.-Ing. Jürgen Schmidt
- ▶ Prof. Dr.-Ing. Mohamed Fatouh
Helwan University, Faculty of Engineering – Mattaria, Cairo
- ▶ Dr.-Ing. Zhivko Zhekov
WTQ, Wärmetechnik Quedlinburg

Kurzfassung

Eine effizientere Energienutzung und die nachhaltige Entwicklung sind für den Umweltschutz von wachsender Wichtigkeit. Die Entwicklung von Gas-Heat-Pumps (GHP) stellen hierbei eine praktische Lösung dar, die hohe Wirkungsgrade und Heizanwendungen bietet. Die GHP nutzt typischerweise die

