

Curriculum vitae

Ahmed Mohamed Awwad Mohamed Serageldin

Post-Doctoral Researcher at Environmental System Research Laboratory,
Faculty of Engineering, Hokkaido University, Japan

Assistant Professor at the Department of Mechanical,
Shoubra Faculty of Engineering, Benha University, Egypt

Master in Energy Resources Engineering, Egypt-Japan University of Science
and Technology, Egypt

Ph.D. in Energy Resources Engineering, Egypt-Japan University of Science
and Technology, Egypt

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Department of Mechanical Engineering, Banha University, Qalubiya, 13511
(Egypt)

Date of Birth: 19th June. 1986

Nationality: Egyptian



Research Interest

- Photovoltaic performance analysis
- Cooling of photovoltaic module
- Building performance (energy efficiency, sustainability, environmental quality, occupant productivity)
- Energy simulation as part of the design Process (passive design; heating, cooling and lighting)
- Ventilation and indoor air quality monitoring and analysis
- CFD analysis of air flow within building spaces.
- Zero Energy Building (ZEB)
- Ground Source Heat Pump (GSHP)
- Energy systems simulation

Publication

Journal

- Ahmed Hamza H. Ali, **Ahmed.A. Serageldin**, Abdel-gaied SM. Effect of Dust and Ambient Temperature on PV Panels Performance in Egypt. *Jordan Journal of Physics*2015;8:113–24.
- **Ahmed.A. Serageldin**, Abdelrahman AK, Ookawara S. Earth-Air Heat Exchanger thermal performance in Egyptian conditions: Experimental results, mathematical model, and Computational Fluid Dynamics simulation. *Energy Conversion and Management* 2016;122:25–38.
- **Ahmed.A. Serageldin**, Sakat Y., Katsura T., Katsunori N. Thermo-hydraulic performance of the U-tube borehole heat exchanger with a novel oval cross-section: Numerical approach, , *Energy Conversion and Management* 2018;177C:406-415.
- **Ahmed A. Serageldin**, Ali K. Abdelrahman, Shinichi Ookawara, Parametric study and optimization of a solar chimney passive ventilation system coupled with an earth-to-air heat exchanger, *Sustainable Energy Technologies and Assessments* 2018;30:263-278

- Ahmed Abdeen, **Ahmed A. Serageldin**, Mona G.E. Ibrahim, Abbas El-Zafarany, Shinichi Ookawara, Ryo Murata, Experimental, analytical, and numerical investigation into the feasibility of integrating a passive Trombe wall into a single room, *Applied Thermal Engineering* 2019; 154:751-768
- Ahmed Abdeen, **Ahmed A. Serageldin**, Mona G.E. Ibrahim, Abbas El-Zafarany, Shinichi Ookawara, Ryo Murata, Solar chimney optimization for enhancing thermal comfort in Egypt: An experimental and numerical study, *Solar Energy* 2019;180:524-536
- Ahmed Nagah Shmroukh, Ali Radwan, Abdalla Abdal-hay Ali, **Ahmed A. Serageldin**, Mahmoud Nasr, New Configurations for Sea Water Desalination System Using Ranque-Hilsch Vortex Tubes, *Applied Thermal Engineering* 2019;113757
- Marwa Dabaeih and **Ahmed A. Serageldin**, Earth Air Heat Exchanger, Trombe Wall and Green Wall for Passive Heating and Cooling in Premium Passive Refugee House in Sweden. *Energy Conversion and Management* 2020, 112555
- **Ahmed A. Serageldin** ; Radwan, A.; Sakata, Y.; Katsura, T.; Nagano, K. The Effect of Groundwater Flow on the Thermal Performance of a Novel Borehole Heat Exchanger for Ground Source Heat Pump Systems: Small Scale Experiments and Numerical Simulation. *Energies* 2020, 13(6), 1418;
- Ali Radwan, Takao Katsura, Saim Memon, **Ahmed A. Serageldin**, Makoto Nakamura, Katsunori Nagano, Thermal and electrical performances of semi-transparent photovoltaic glazing integrated with translucent vacuum insulation panel and vacuum glazing, *Energy Conversion and Management* 2020, (215)112920.
- **Ahmed A. Serageldin**, Ahmed Abdeen, Mostafa M.S. Ahmed, Ali Radwan, Ahmed N. Shmroukh, Shinichi Ookawara, Solar chimney combined with earth to-air heat exchanger for passive cooling of residential buildings in hot areas, *Solar Energy*,2020;206:145-162
- Memon, S., Katsura, T., Radwan, A., Zhang, S., **Ahmed A. Serageldin**. Abo-Zahhad, EM., Sergey, S., Memon, AR., Khan, SW., Yang, S., Jama, HH., Hoseinzadeh, S., Sara, ID., Fang, Y., Danilevski, L., Isaev, R., Kiani, A. 2020. Modern eminence and concise critique of solar thermal energy and vacuum insulation technologies for sustainable low-carbon infrastructure, *International Journal of Solar Thermal Vacuum Engineering*, 1, 1, pp. 52-71.
- Memon, S., Mihreteab, M., Katsura, T., Radwan, A., Zhang, S., **Ahmed A. Serageldin**., Abo-Zahhad, EM. 2020. Experimental and theoretical performance evaluation of parabolic trough mirror as solar thermal concentrator to thermoelectric generators. *International Journal of Solar Thermal Vacuum Engineering*, 1, 1, pp. 22-38.
- Hobyung Chae, Katsunori Nagano, Yoshitaka Sakata, Takao Katsura, **Ahmed A. Serageldin** and Takeshi Kondo, Analysis of Relaxation Time of Temperature in Thermal Response Test for Design of Borehole Size. *Energies* 2020, 13(13), 3297;
- **Ahmed.A. Serageldin**, Sakat Y., Katsura T., Katsunori N. Performance enhancement of borehole GSHP using single U-tube heat exchanger with a novel oval cross-section and spacer. *Sustainable Energy Technologies and Assessments*,2020, accepted, in press.
- Ahmed, M.; Radwan, A.; Serageldin, A.; Memon, S.; Katsura, T.; Nagano, K. Thermal Analysis of a New Sliding Smart Window Integrated with Vacuum Insulation, Photovoltaic, and Phase Change Material. *Sustainability* 2020, 12, 7846.
- Oussama Rejeb, Ali Radwan, Essam M. Abo-Zahhad, Chaouki Ghenai, **Ahmed A. Serageldin**, Mostafa Ahmed, Ahmed A.H. El-Shazly, Maamar Bettayeb, O. Abdelrehim, Numerical Analysis of Passive Cooled Ultra-High Concentrator Photovoltaic Cell Using Optimal Heat Spreader Design, *Case Studies in Thermal Engineering*, 2020,100757.

International conference

- **Ahmed A. Serageldin**, Yehia El-Mahgary, Ahmed Hamza H. Ali and Ahmed Khairy. Comparing Socioeconomic & Environmental Impacts of Building 2GW PV Power Plant (PP) in Both Sides of the Mediterranean. Proc. of the International Renewable and Sustainable Energy Conference (IRSEC'13), March 7-9 2013, Ouarzazate, Morocco
- **Ahmed A. Serageldin**, Yehia El-Mahgary, Ahmed Hamza H. Ali and Ahmed Khairy Effect of the Environmental Conditions in Harsh Areas of Egypt on PV System Performance, Int. Conf./ Humboldt Kolleg "Building International Network for Enhancement of Research in Jordan,Amman, Jordan, April

3-5 2014

- **Ahmed A. Serageldin**, Ahmed Hamza H. Ali, Ali K. Abel-Rahman and S. Ookawara. Effect of Dust Deposition on Performance of Thin Film Photovoltaic Module In Harsh Humid Climate. International Conference on Renewable Energy Research and Applications, ICRERA-2013, 20-23 October 2013, Madrid, Spain.
- **Ahmed A. Serageldin**, Ali K. Abel-Rahman, Ahmed Hamza H. Ali, Mohamed R.O. Ali, S. Ookawara, Soil Temperature Profile for some New Cities in Egypt: Experimental Results and Mathematical Model. 14th International Conference on Sustainable Energy Technologies SET2015, 25-27 Aug, Nottingham, UK
- **Ahmed A. Serageldin**, Y. Sakata, T. Katsura and N. Katsunori, Numerical investigation on the thermal performance of ground heat exchanger with oval and circular U-tube cross-section. SHASE, Hokkaido, 2018
- **Ahmed A. Serageldin**, Yoshitaka Sakata, Takao Katsura, Katsunori Nagano, Numerical investigation on the thermal performance of ground heat exchanger with different cross-sections. Grand Renewable Energy 2018, 19th-23th June, Yokohama, Japan
- **Ahmed A. Serageldin**, Yoshitaka Sakata, Takao Katsura, Motoaki Ooe and Katsunori Nagano, Long-term CFD simulation of the performance of GSHP with a novel oval U-tube, SHASE, Hokkaido, 2019
- Minzhi Ye, **Ahmed A. Serageldin** and Katsunori Nagano, Radiant Ceiling Panel (RCP) for heating/cooling application Part 1. Experiment study on the cooling performance of RCP with a novel curved surface under different operating condition, SHASE, Hokkaido, 2020.
- **Ahmed A. Serageldin**, Minzhi Ye and Katsunori Nagano, Radiant Ceiling Panel (RCP) for heating/cooling application Part 2. Parametric study on thermal performance of RCP with a novel curved surface by numerical approach, SHASE, Hokkaido, 2020.
- **Ahmed A. Serageldin**, Minzhi Ye and Katsunori Nagano, Radiant Ceiling Panel (RCP) for heating/cooling application Part 3. A numerical comparison between flat and a novel curved surface RCP, SHASE, Hokkaido, 2020

Book Chapter

- Yoshitaka SAKATA, **Ahmed A. Serageldin**, Takao KATSURA, Motoaki Ooe and Katsunori NAGANO, Evaluating Thermal Performance of Oval U-Tube for Ground-Source Heat Pump Systems from in Situ Measurements and Numerical Simulations, Proceedings of the 11th International Symposium on Heating, Ventilation and Air Conditioning (ISHVAC 2019)

Under preparation

- **Ahmed A. Serageldin**, Minzhi Yu, Katsunori NAGANO, Numerical investigation on the thermal performance analysis of a novel concave curved, and segmented surface radiant ceiling panel (CCSRCP), Building and Environment, 2020, Under review
- **Ahmed A. Serageldin**, Yoshitaka SAKATA, Takao KATSURA, Katsunori NAGANO, Long-term simulation of the performance of a novel oval u-tube with a novel spacer. Energy, 2018, under preparation

Education

Postgraduate Education

Feb. 2014 to Feb. 2017	<p>Ph.D. student in Energy Resources Engineering Egypt-Japan University of Science and Technology, School of Energy, Environmental and Chemical and Petrochemical, Department of Energy Resources Engineering</p> <p>Complete at least 54 credit hours within the following guidelines: <u>1st and 2nd semester:</u> Coursework of 18 credit hours, including core courses of 6 credit hours, elective courses of 6 credit hours and a Research Seminar of 6 credit hours. <u>3rd and 4th semester:</u> Thesis work (18 credit hours) <ul style="list-style-type: none"> ▪ Research Title: <i>'Development of efficient passive heating, cooling, and ventilation system for residential buildings'</i> ▪ Experimental study of the thermal performance of an Earth-Air Heat Exchanger(EAHE) <u>5th and 6th semester:</u> Thesis work (18 credit hours)</p>
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- Mathematical modeling of the temperature distribution of soil and air flow through EAHE
- CFD simulation of EAHE and Solar chimney
- TRNSYS simulation of Building coupled with solar chimney and EAHE
- Economic analysis of constructing proposed system in Egypt.

Feb. 2012 to
Feb. 2014

Master grad in Energy Resources Engineering

Egypt-Japan University of Science and Technology,
School of Energy, Environmental and Process Engineering,
Department of Energy Resources Engineering

Complete at least 36 credit hours within the following guidelines:

1st and 2nd semester: Coursework of 18 credit hours, including core courses of 6 credit hours, elective courses of 9 credit hours and a Project-Based Learning course of 3 credit hours.

- Studying the necessary fundamental tools and skills for tackling the current energy crisis and environmental problems with a focus on the development of energy conversion technologies through advanced working systems with high efficiency
- Participating in project-based learning activities in topics of applied nature related to the fields of specialization.

3rd and 4th semester: Thesis work (18 credit hours)

- Research Title: *‘Effect of dust deposition and ambient air temperature on the performance of photovoltaic module’*

September.
2008 to July
2009

Pre-Master Courses in Mechanical Engineering

Department of Mechanical Engineering, Shoubra Faculty of Engineering, Benha University, Qalubiya (Egypt)

Studying five subjects including;

- Heat transfer, Thermodynamics, Measurements, Numerical analysis, Fluid mechanics

Undergraduate Education

Bachelor degree in Mechanical Engineering.

Oct. 2003 to
July. 2008

Department of Mechanical Engineering,
Shoubra Faculty of Engineering, Benha University, Qalubiya (Egypt)
Cumulative Grade: very good with Honor (Percentage: 84.75 %)
Cumulatively ranked the 1st in the Department of Mechanical Engineering among 200 students.
Graduation Project Grade: Distinction

Studying 57 courses in 10 semesters;

- Heat transfer, Fluid mechanics, thermodynamics, Power station, Turbomachinery, Internal combustion engine, Hydraulics, Matlab, Air conditioning, Refrigeration, Fire protection, Internal combustion engine project: *“Performance of car braking system”*.

Work Experience

Teaching

Dec. 2008 -
Present

Teaching Assistant

Department of Mechanical Engineering,
Shoubra Faculty of Engineering, Benha University, Qalubiya (Egypt)

Main activities and responsibilities include;

- Preparing and delivering lab experiments and tutorials.
- Discussing and grading homework assignments

Courses include;

- Graduation Project
- Heat transfer
- Refrigeration and Air conditioning
- Thermodynamics
- Fluid mechanics
- Measurements
- Fire protection

Dec. 2019-
present

Teaching Assistant

Department of Human Environmental Systems, Graduate School of Engineering,
Hokkaido University, Japan

Teaching Numerical Analysis Methods

<http://labs.eng.hokudai.ac.jp/labo/envsys/english/nagano-en.html>

Research

July. 2014 to
January 2015

Research Assistant (Part-Time)

Energy Resources Engineering Department

Egypt-Japan University of Science and Technology, Alexandria, Egypt

Funded Research Project titled “ Strategic Hubs for the Analysis and Acceleration of the Mediterranean Solar Section (SHAAMS).”

funded by the European Union within the framework of cooperation across the borders of the Mediterranean (ENPI CBC Med)

The energy center of excellence, E-JUST coordinator Prof. Ahmed Hamza.

<http://www.shaams.org/>

Tasks included;

- Meeting with stakeholders of the industrial sector to increase awareness towards solar energy
- Conducting teaching sessions about photovoltaic technology and its future in the Egyptian market.

April 2016 to
November 2016

Visiting researcher (Full time)

Tokyo Institute of Technology, Tokyo, Japan

Using High Performance Computing (TSUBAME) in Optimizing passive heating/cooling and ventilation System by CFD simulation

July 2017 to
Jan 2019

Research project Assistant (Part-Time)

Malmo University, Sweden

Funded Research project titled “ Minus carbon and plus energy: Design home kit.”

Funded by Crafoord, Aforsk, ARQ, Stiftelson Mellby and Almi Malmo

Project leader: Marwa Dabaieh

<http://muep.mau.se/handle/2043/26411>

Task included:

- CFD simulation of fluid flow and heat transfer inside the building
- TRNSYS simulation of the energy performance of this house

Dec 2017 to
present

Postdoctoral researcher (Full time)

Hokkaido University, Hokkaido, Japan

Development of low cost and high-performance ground source heat pump system, and its design and evaluation method

Funded by New Energy and Industrial Technology Development Organization (NEDO)

Dec 2018 to
present

Research Advisor

Hokkaido University, Hokkaido, Japan

Development of low energy radiant ceiling cooling/heating system

Funded by SANKEN Environmental engineering

Industry

Aug 2014 to Dec. 2015	<p>Technical office engineer (part-time) Middle East for Electromechanics and Security systems (MIDSC) Mahmoud Banaani St. Off of Essam Elbanai region ninth Nasr City (Egypt). http://www.middleeast-eg.net/</p> <p>Duties Included;</p> <ul style="list-style-type: none"> ▪ Design and selection of Offgrid and Ongrid photovoltaic system. ▪ Prepare technical specifications of the photovoltaic power generation system. ▪ Prepare single and three line diagram of photovoltaic system electrical connections.
May 2017 to November 2017	<p>Executive technical manager (Part-time) Accurate Green Solutions (AGS), 6th of October, Giza, Egypt</p> <p>Duties Included:</p> <ul style="list-style-type: none"> ▪ Prepare technical and financial proposal ▪ Supervising the construction of PV systems ▪ Prepare and designing the technical tenders for Mega-project of PV systems
Conferences, Workshops and Training Programs	
19 th Nov. 2012 to 24 th Nov. 2012	<p>International Advanced Training Seminar on Solar Thermal Electricity Seville, Spain, for young researches in the field of energy technologies.</p> <p>The program comprises presentations and discussions on the following subjects:</p> <ul style="list-style-type: none"> ▪ Photovoltaic technologies; ▪ Concentrated photovoltaic technologies; ▪ Multijunction solar cells; ▪ Dish Stirling engines; ▪ Energy storage technologies ; ▪ Future trends.
10 th April to 12 April 2019	<p>IEA ECES Annex 27 - Quality Management in Design, Construction and Operation of Borehole Systems; April 10-12 in Kyoto/Osaka, Japan http://www.eces-boresysqm.org/</p> <p>The specific objectives are:</p> <ul style="list-style-type: none"> ▪ Collect and compile national standards and guidelines for BTES/BHE for heating and cooling ▪ Analyze national design procedures and construction methods ▪ Identify and investigate problems of the design and construction phases ▪ Work out handbooks and guidelines for design and construction in order to avoid future mistakes ▪ Investigate operational failures ▪ Work out preventative guidelines for monitoring, maintenance and rehabilitation measures ▪ Identify related problems in order to establish further R&D
2 nd Feb 2013 to 9 th Feb 2013	<p>ANSYS FLUENT simulation training, EJUST, Egypt. By ANSYS Inc.</p> <ul style="list-style-type: none"> ▪ Design modeler 2d and 3d ▪ Meshing ▪ Fluent
22 nd March 2015 to 26 th March 2015	<p>Energy management system Auditor and lead Auditor ISO 5001 standard, EJUST, Egypt Dr. Tarek A.Tawab El Kholy, Professional Training BF Manager, TÜV Rheinland Egypt Ltd.</p> <ul style="list-style-type: none"> ▪ Standard ISO 50001:2011 - Energy Management System Requirements ▪ Principles of energy technology ▪ Regulatory issues ▪ Typical energy use, methods, and technologies for increasing efficiency ▪ Energy measurement units, tariffs ▪ Methods for analysis of energy use ▪ Energy Performance Indicators, monitoring and performance measurement
16 th April 2015	<p>Workshop module entitled: " Competitive Research proposal Writing " of the further domain "program preparation" within the DAAD Kairo Akademie, by prof. Galal H. Galal-Edeen</p>
April 2014	<p>Training program: TRAnSient SYstem Simulation Tool (TRNSYS) seminar Dr. Francesco Reda, Senior Scientist, VTT, Technical Research Centre of Finland</p>

- TRNSYS introduction
- Case study: Building model creation
- Solar Thermal System
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Jan. 2014	<p>Energy Audit course, EJUST, Egypt By Prof. Ahmed Hamza, chairperson of Excellence Center of Energy and Environment in EJUST</p> <ul style="list-style-type: none"> ▪ Energy audit methodology ▪ Energy audit instrumentation ▪ Auditing tools ▪ Building systems ▪ Lighting ▪ HVAC ▪ Controls ▪ Boilers and steam systems ▪ Reviewing auditing Reports
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Awards and Scholarships

April 2016 to Nov. 2016	International exchange student in Tokyo Institute of Technology funded by Ministry of Higher Education (MOHE).
2014	Doctoral scholarship from Egypt-Japan University of Science and Technology Full tuition fees and maintenance costs (amounting to \$30000 over two years)
2012	Master scholarship from Egypt-Japan University of Science and Technology Full tuition fees and maintenance costs (amounting to \$30000 over two years)

Personal skills and competences

Language	Able to carry out and publish academic research and other technical outputs in the following: Arabic (Mother's tongue) English (Excellent) TOEFL IBT score: 82 (Academic Module), (2014, expired now)
Social skills and competencies	<ul style="list-style-type: none"> • Excellent presentation & communication skills. • Active team member and independent research
Technical skills and competencies	<ul style="list-style-type: none"> • Ability to work well under pressure. • Ability to work well with all levels of management and personal. • Patient and highly self-motivated. • AutoCAD 2010 (2D) • Solid works • DesignBuilder V.4
Computer skills and competencies	<ul style="list-style-type: none"> • TRNSYS 17 • SigmaPlot • Origin • ANSYS, Fluent • Adobe Photoshop CS5 • MATLAB • Sketch up

Affiliations

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- 2017-present** Postdoctoral researcher at Environmental System Engineering Laboratory, Hokkaido University, Japan
- 2008 - present** Assistant Lecturer at the Department of Mechanical Engineering, Shoubra Faculty of Engineering, Benha University, Qalubiya (Egypt)
- 2014-present** Member at World Society of Sustainable Energy Technologies (WSSET)
- 2013 -2014** ERE representative in Student Union in Egypt-Japan University of Science and Technology
- 2008 - present** Registered Engineer
Egypt Engineers Syndicate, Cairo, EGY

References

Prof. Nagano Katsunori
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Hokkaido University, Japan, Tel +81-11-706-6285

Prof. Marwa Dabaeih
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Professor, Department of Architecture, Design and Media Technology
Professor, The Technical Faculty of IT and Design, Aalborg University,
Denmark,

Prof. Dr. Shinichi Ookawara
sokawara@chemeng.titech.ac.jp

Associate Professor for E-JUST, Dept. of Chem.Eng., Tokyo Inst. of Tech.