Pouria Ahmadi, Ph.D

PROFESSIONAL SKILLS

- ✓ 13 years of engineering research & teaching in the academic environment.
- ✓ 6 years of global engineering experience in an industrial environment.
- ✓ Published landmark paper for system modeling, design and optimization for energy systems.
- ✓ Published two books in John Wiley (2017) and Elsevier (2020).
- ✓ Research on optimization of various energy systems, net zero energy/emission buildings, integrated renewable energy systems.
- ✓ Studied fuel cell degradation for transportation application (mechanism, experiments and durability prediction).
- ✓ Developed an in-house software for life cycle assessment of six alternative fuels for transportation in various Canadian provinces with the effect of fuel cell degradation/Battery aging on GHG emission.
- ✓ Studied the deployment of various electric vehicles in United states based on annual vehicle traveled mile.
- ✓ Modeled, analyzed, optimized and installed the supplementary firing on combined cycle power plant which resulted in an increase in 7 MW output power.
- ✓ Taught engineering Online and Traditional courses.
- ✓ Developed graduated Optimization of energy systems course.
- ✓ Being listed in the World Top 2% Scientists based on standardized citation indicators compiled by Stanford University. Outstanding Reviewer Award, Journal of Power Sources, ELSEVIER, December 2020.
- ✓ Most cited article for paper entitled Energy, exergy and exergoeconomic analysis of a steam power plant: A case study. International Journal of Energy Research, Volume 33, Issue 5, pages 499–512, April 2009.
- ✓ Top 10 article of the month for paper entitled Cost and Entropy Generation Minimization of a Cross-Flow Plate Fin Heat Exchanger Using Multi-Objective Genetic Algorithm. ASME Journal of Heat Transfer, 133(2), 021801 (Nov 03, 2010), doi:10.1115/1.4002599.
- ✓ More than 5700 citation with h-index of 43 according to google scholar.
- ✓ US Green Card Holder

EDUCATION

2013 **Ph.D. in Mechanical Engineering,** Ontario Tech University, Canada
2009 **M.Sc in Mechanical Engineering,** Iran University of Science and Technology (IUST), Iran
2006 **B.Sc in Mechanical Engineering,** Shahid Beheshti University, Iran

EMPLOYMENT HISTORY

University of Tehran, IRAN **Sept 2018- Present**
Assistant Professor

Teaching

- ➢ **Thermal Power Plant Technologies** (Senior level - Class of 50+ students), Fall 2018, Fall 2019, Fall 2020.

  (This is an applied course and requires a good background of thermo-fluid science to transform the senior ME students to junior engineers. In this course, students have a chance to visit one of the real power plants. The main objectives of this course are preparing students with the basic concepts of operation, cold-start of the power plants, various types of boilers, how cooling towers

works, different types of condenser, combustion in power plants, waste heat recovery options and power plant efficiency enhancement. Students will be given a final course project which is based on the problems raised in the power plant visit and they will try to come up with new ideas how to overcome that concerns/problems.

- **Renewable Energy** (Senior level - Class of 40+ students), Spring 2019 and Spring 2020

  (This course is an interesting course for senior undergraduate students who want to learn renewable energy and their applications. In this course, they will try to understand the various types of renewable energies and their importance. Solar energy is covered and they will understand how to produce electricity with PV and how heating can be provided by flat plate collector, parabolic through and heliostat tower. Biomass, wind, geothermal and ocean energy are also covered and their basic concepts and modeling and limitation are also covered. They also learn the problems about renewable energies which is their intermittency and they learn how energy storage can assist renewable energies to overcome the mismatch. The basic of CAES, LAES, pump Hydro and electrochemical energy storage is also taught. They will also learn how to use TRNSYS software which is a power tool for the transient simulation of renewable energy systems. To better understand the concepts, a final practical project will be assigned to each group of students with two students to improve their teamwork and skillsets.

- **Thermodynamic II** (Intermediate level- Class of 60+ students), Fall 2018, Fall 2019

- **Advanced Energy Systems** (Graduate level - Class of 15 students), Spring 2019, Spring 2020, Spring 2021

  (This course a graduate level course and aims at improving the ability of students to simulate, analyze, assess and understand advanced energy systems. In this course they learn exergy analysis as a potential tool for pinpointing the loses and destruction in energy systems and they will apply that in analyzing the advanced energy systems. Another important part of this course is to improve their computer programming skills. Therefore, they will learn how to read thermodynamic properties for various energy systems. They will learn how to link CoolProp and RefProp and EES software with Matlab and Python to have thermodynamic properties. Advanced power plant technology such as gas turbine, combined cycle and steam power plants will be analyzed and simulated and incomplete combustion will be discussed with equilibrium constant. This is where they need to learn how to do try and error to calculate excess air, flame temperature and other properties. Students also learn about single and double effect LiBr/H2O absorption chillers, single effect LiCl absorption chiller, Active magnetic cooling, waste heat recovery options, hydrogen production methods, SOFC and PEM fuel cell and their modeling and cost assessment. Students are required to finalize a final project where they need to model, analyze and assess a given advanced energy system and also apply techno-economic assessment. They are required to use a combination of MATLAB/Python for system simulation and CoolProp/Refprop and TRNSYS. They also learn a scientific final report should be look like.

- **Optimization of Energy Systems** (Senior and Graduate level- Class of 20+ students), Fall 2018, Fall 2020.

  (This is a graduate level course I developed at School of Mechanical Engineering at University of Tehran. The goal of this course is to present and apply techniques for the modelling and the thermo-economic optimisation of industrial process and energy systems. The course covers the problem statement, the solving methods for the simulation and the single and multi-objective optimization problems. Students learn how to optimize a system with linear and non-liner constraints.

Research Projects

- Optimization and retrofitted an industrial heat recovery steam generator (HRSG) for V94.2 gas turbine combined cycle power plant to reduce the mass of the boiler which eventually leads to decreasing the cost. The optimization of heat exchangers could help us to reduce 1.5% of the weight of the HRSG and 1% cost reduction. It was based on an funded project at University of Tehran and MAPNA company in Tehran, Iran.
- Design and size selection optimization of a solar/battery based Conex for remote areas and various climate zones. This project was based on the needs of Mammut Industrial Group, a company which design and manufacture the containers and Conex in Iran and it is a famous company for this. The main intention was to have a Conex which can meet the electricity, heating and cooling using solar energy which can be used at various location in Iran when there is earthquake and flood and other unprecedented situations occurred.
- Working on the development of an in-house life cycle assessment (LCA) software for the replacement of passenger vehicles and public buses in Tehran, with electric vehicles and electric buses. Since Tehran, the capital city of Iran, is a crowded city with the population over 15 million people, air quality and GHG emission reduction is one of the most important factore that has affected the life quality in this city. Transportation accounts for 35% of the total GHG emission in Tehran, Iran. In this project which is funded by MAPFAN research institute, University of Tehran seed grant and Niro Research Institute (NRI), the replacement of passenger gasoline cars and diesel public buses with electric vehicles are investigated and software is developed. This software has the ability to dynamically simulate the vehicles and calculate the fuel consumption, lifecycle emission, vehicle power, energy storage by regenerative braking. Various driving cycle at different locations in Tehran are selected where road angle, driving behavior, number of stops, traffic conditions and vehicle specifications vary. In this software, there are several options where we can enter as inputs such as driving patterns, vehicle specification, battery aging, vehicle speed as a function of time, road angle and etc. Another important feature of this software is to consider the environmental conditions such as wind velocity, ambient temperature and aggressive driving. The software will also calculate the LCA in each phase of the fuel production and vehicle production. The output of this software will help the automakers and policy makers to see where and under which condition they can deploy EVs in Iran.
- Development of an Energy Flow Audit software for Iran Oil Ministry. In this project, software is developed to calculate the losses in various part of the plant for crude oil extraction. A software has a dynamic feature where we can drag and drop components to make any plant required for energy flow audit.
- Fuel cell degradation prediction for vehicular applications using machine learning. One of the main challenges facing the widespread deployment of hydrogen fuel cell vehicle, is their durability. Since fuel cell vehicles have not been operated on the road for several years and they are in the research phase, the data for real world driving and fuel cell degradation is not available. Most of the data available is for the benchmark testing of lab scale PEM fuel cells. In this research, we try to predict the fuel cell degradation rate based on some experimental data and predict the performance of hydrogen fuel cell for passenger vehicle up to 6000 h which is equivalent to 10 years of their operation. We try to use LSTM, DNN and SRNN for voltage prediction and compare the results. This research is based on the Vehicle, Fuel and Environment Research Institute internal fund at University of Tehran.

Capstone Projects

- Design, optimization and construction of a cooling system for laptops.
- Energy audit and integration of renewable energy for the new building of the school of mechanical Engineering at University of Tehran.

- Experimental investigation and lifetime calculation of the membrane distillation (MD) for water desalination using Artificial Intelligence
- Simulation, design and construction of an electric bike at various location in Tehran, Iran.
- Dynamic simulation and the effect of ambient temperature and driving habits on the performance of the electric bike.
- Simulation, design and techno-economic optimization of an active magnetic refrigeration.

Students Supervision

- Supervised 8 graduate students.
- Advisor of 5 graduate students.
- Supervised 16 undergraduate student so far for their Capstone projects.

Industrial Partnership

- Iran National Science Foundation (INSF)
- Niro Research Institute (NIR), Tehran, Iran
- MAPNA Group.
- Iran Khodro Automaker company
- MAPFAN research institute.

University of Illinois, Urbana-Champaign, USA **May 2016- May 2018**
Postdoc Research Associate

Teaching

- **Introduction to Energy Sources** (Senior level - Class of 60+ students), Fall 2017.
  (This is senior level course and tries to improve the knowledge of undergraduate students with basic concept of energy sources. Coverage of all energy sources including fossil fueled, solar, hydro, and nuclear power. Discussion of energy related incidents with emphasis on environmental, economic, and social impact is also covered.

Research Projects

- Explored the complex answer to a seemingly simple question: What type of electric vehicle-hybrid-electric, plugin hybrid or battery powered all-electric-best balances environmental and consumer needs? Tracing the emissions and costs of vehicle construction, purchase, and operation and the emissions and costs of their possible fuel sources. In this project I built an optimization model to analyze and rank vehicles given a certain annual range of miles driven. We aimed to comprehensively model and compare different vehicles to find the tradeoffs and tipping points in consumer choices. At the end of this project the following questions were answered:
  - ✓ What is the optimal mix of low carbon fuels for meeting transportation needs over the next several decades?
  - ✓ What is an optimal pathway to transition from the current vehicle fleet to a low carbon fleet in the US ?
  - ✓ What are the policy incentives needed to achieve the optimal mix of fuels and vehicles to achieve targeted reductions in greenhouse gas emissions at least cost?

- ✓ What is the design and investment needed in multiple critical infrastructures at the regional scale to support an optimal mix of multiple complementary energy sources especially renewable energy?

- Quantified water-related electricity grid dynamics in response to widespread use of Electric Vehicles (EVs). In this research, the effect of increasing the penetration of EVs to the market and its effect on the water-related electricity grid was investigated. Since charging the EVs requires electricity which should come from the grid, increasing the number of EVs, will impose a significant load on the grid. Therefore, we need to either increasing the output electricity of the existing power plants or installing new power plants. In the former one, cooling towers in power plants plays a significant role as they need water for cooling. In this project we investigated the influence of these factors. The following Optimal decisions were considered:
  - ✓ Power plant characteristics
  - ✓ Power grid characteristics
  - ✓ Grid reliability requirements
  - ✓ Power plant locations in river basin
  - ✓ Ambient hydrological and meteorological conditions

- Interdependent Critical Infrastructure Systems for Synergized Utilization of Multiple Energy Sources toward Sustainable Vehicular Transportation. In this part of a multidisciplinary project, my role was to do life cycle assessment of various alternative fuels for sustainable vehicular transportation.
- Design, optimization and construction of heat exchangers for latent heat thermal energy storage in electric vehicles.

Simon Fraser University (SFU), Canada **Dec 2013- May 2016**
Postdoc Research Associate

Research Projects

- Conducted experiments for catalyst and membrane degradation to determine leaks and conductivity losses on the life cycle assessment of fuel cell vehicles. In this project, several experiments were carried out to see the effect of radical attract on the CL and see the degradation mechanism. I have learnt how to use characterization techniques such as SEM and FIB-SEM. The final target was to understand how can we mitigate the degradation using accelerated durability tests.
- Developed affordable low-carbon emission vehicle technologies to meet climate goals: A social, economic, and technical analysis of the market and public policy.
- Developed a customized lifecycle assessment software of alternative energy systems with focus on hydrogen fuel cell vehicles . This software should have an ability to consider the effect of fuel cell degradation on the lifecycle metrics of the vehicles. The results should that the fuel cell degradation for a Hyundai Tuscan hydrogen fuel cell is responsible for an increase in 7% of hydrogen fuel consumption.
- Studied the life cycle assessment of hydrogen and diesel dual-fuel class 8 heavy duty trucks. In this industrial project funded by by Natural Sciences and Engineering Research Council (NSERC) of Canada in partnership with Hydra Energy world's first Hydrogen-as-a-Service provider for commercial fleets, we aimed to see the effect of hydrogen injection to dual-fuel diesel engine for trucks.
- Studied a comparative life cycle assessment of hydrogen fuel cell passenger vehicles in different Canadian provinces. In this project we looked at various hydrogen production methods in four major provinces in Canada, Ontario, British Columbia, Quebec and Alberta. The lifecycle assessment of for the deployment of hydrogen fuel cell vehicle in these providence were investigated.
- Benchmark lab testing of FCs.

S2E Technology, Canada **Sep-Dec 2013**
Research and Design Associate

- Designed, simulation and optimization of a solar based energy system for the net-zero energy community in London Ontario, in cooperation with London Hydro.
- Studied the Energy Storage with Energy Efficient Buildings and Districts: Optimization and Automation.
- Feasibility studied of liquid air as storage for net zero energy community in London Ontario, Canada.

Ontario Tech University , Canada **Sep 2009-Aug 2013**
Ph.D. Candidate & Research Assistant (RA)

- Modeled, analyzed, assessed and optimization of integrated energy systems for residential buildings in Ontario, Canada. In this case, there major scenarios of full renewable, renewable and fossil and full fossil based integrated energy systems were considered and optimized.
- Thermal system analysis and optimization of HVAC for residential buildings in Canadian residential sector.
- Transient thermal performance assessment of a hybrid solar integrated energy system in Toronto, Canada.
- Reviewing Mechanical and Architectural drawing of the multi-family buildings and sequence of control of main mechanical systems.
- Creating consumption baseline accordingly for integrated buildings.
- Designed a solar based integrated energy system for net zero buildings.

Teaching Assistant (TA)

- Thermodynamics (Two semesters)
- Introduction to Energy Systems (Two semesters)
- Thermodynamics and Heat Transfer (Two semesters)
- Fluid Power Systems
- Fluid Mechanics
- Sustainable and Alternative Energy Technologies (Class and Lab)
- Calculus I (Two times)
- Calculus II

Mapna Boiler, Iran **Sep 2006- Jan 2008**
Process Engineer

- Equipment sizing (such as Boiler Feed Pump, Condensate preheater pump, Condensate extraction pump) for HRSG installation.
- Designing the HRSG up to 270MW with natural circulation.
- Design and simulation and optimization of Heat Recover Steam generators.
- Installation and performance assessment of duct burners for heat recovery steam generator in Neka combined cycle power plant in Iran.
- Performance improvement of combined cycle power plant by reduction of exergy destruction for Shiraz combined cycle power plant.

PUBLICATIONS

Books

- Ibrahim Dincer, Marc A. Rosen, Pouria Ahmadi. **Optimization of Energy Systems.** John Wiley and Sons. (https://www.amazon.ca/Optimization-Energy-Systems-Ibrahim-Dincer/dp/111889443X).
- Pouria Ahmadi, Farshcad Torabi. **Simulation of Battery Systems: Fundamentals and Applications**. (https://www.elsevier.com/books/simulation-of-battery-systems/ahmadi/978-0-12-816212-5)

Book Chapters

1. Pouria Ahmadi , Ibrahim Dincer, Energy Optimization, Chapter 28, Volume 5, **Comprehensive Energy Systems,** Elsevier Publisher, 2018.
2. Pouria Ahmadi , Ibrahim Dincer. Exergoeconomics, Chapter 8, Volume 1, **Comprehensive Energy Systems,** Elsevier Publisher, 2018.
3. Pouria Ahmadi , Ibrahim Dincer.Optimization in Energy Management, Chapter 9, Volume 5, **Comprehensive Energy Systems,** Elsevier Publisher, 2018.
4. Pouria Ahmadi , Ibrahim Dincer, Marc A. Rosen. **Environmental impact assessments of integrated energy systems**. Chapter 4 of book entitled Causes, Impacts and Solutions to Global Warming, Springer, 2013, ISBN 978-1-4614-7588-0.
5. Pouria Ahmadi , Mohammad Hasan Saidi, Ibrahim Dincer **Performance Assessment of a Hybrid Solid Oxide Fuel Cell-Gas Turbine Combined Heat and Power System.** Chapter 20 of the book titled Progress in Exergy, Energy and the Environment, Springer, 2014, ISBN 978-3-319-04680-8.
6. Pouria Ahmadi, Ibrahim Dincer, Marc A. Rosen. **Performance Evaluation of Integrated Energy Systems for Buildings.** Chapter 6 of book titled Progress in Sustainable Energy Technology, Volume 1, 2014, ISBN 978-3-319-07895-3.
7. Ali Mousafarash, Pouria Ahmadi. **Exergy and Exergo-economic Based Analysis of a Gas Turbine Power Generation System.** Chapter 7 of the book titled Progress in Exergy, Energy and the Environment, Springer, 2014, ISBN 978-3-319-04680-8.
8. Shoaib Khanmohammadi, Pouria Ahmadi. **Design and Optimization of an Integrated System to Recover Energy from a Gas Pressure Reduction Station.** Chapter 6 of the book titled , Progress in Clean Energy, Springer International Publishing Switzerland, DOI 10.1007/978-3-319-16709-1_6

Selected Journals (Peer Reviewed)

J1. M Taslimi, P Ahmadi, M Ashjaee, M A Rosen, Design and mixed integer linear programming optimization of a solar/battery based Conex for remote areas and various climate zones, ***Sustainable Energy Technologies and Assessments,*** 45: 101104- 101114, 2021.

J2. M. Alirahmi. S. Mousavi. A Razmi, P Ahmadi. A comprehensive techno-economic analysis and multi-criteria optimization of a compressed air energy storage (CAES) hybridized with solar and desalination units. ***Energy Conversion and Management,*** In Press, 2021.

J3. S Sadeghi, P Ahmadi. Thermo-economic optimization of a high-performance CCHP system integrated with compressed air energy storage (CAES) and carbon dioxide ejector cooling system. **Sustainable Energy Technologies and Assessments** 45, 101112, 2021.

J4. E Assareh, SM Alirahmi, P Ahmadi, A Sustainable model for the integration of solar and geothermal energy boosted with thermoelectric generators (TEGs) for electricity, cooling and desalination purpose, ***Geothermics*** 92, 102042, 2021.

J5. A Azad, I Fakhari, P Ahmadi, N Javani. Analysis and optimization of a fuel cell integrated with series two-stage organic Rankine cycle with zeotropic mixtures. **International Journal of Hydrogen Energy**, In Press, 2021.

J6. M Vojdani, I Fakhari, P Ahmadi, A novel triple pressure HRSG integrated with MED/SOFC/GT for cogeneration of electricity and freshwater: Techno-economic-environmental assessment, and multi-objective optimization, ***Energy Conversion and Management,*** 233, 113876, 2021.

J7. E Gholamian, P Hanafizadeh, P Ahmadi, L Mazzarella. 4E analysis and three-objective optimization for selection of the best prime mover in smart energy systems for residential applications: a comparison of four different scenarios. **Journal of Thermal Analysis and Calorimetry**, 1-21, 2021.

J8. I Fakhari, A Behzadi, E Gholamian, P Ahmadi, A Arabkoohsar. Design and tri-objective optimization of a hybrid efficient energy system for tri-generation, based on PEM fuel cell and MED using syngas as a fuel. **Journal of Cleaner Production** 290, 125205, 2021.

J9. I Fakhari, A Behzadi, E Gholamian, P Ahmadi, A Arabkoohsar. Comparative double and integer optimization of low-grade heat recovery from PEM fuel cells employing an organic Rankine cycle with zeotropic mixtures. **Energy Conversion and Management** 228, 113695, 2021.

J10. P Ahmadi, S Khanmohammadi, F Musharavati, M Afrand. Development, evaluation, and multi-objective optimization of a multi-effect desalination unit integrated with a gas turbine plant. **Applied Thermal Engineering** 176, 115414, 2021.

J11. F Raymand, P Ahmadi, S Mashayekhi. Evaluating a light duty vehicle fleet against climate change mitigation targets under different scenarios up to 2050 on a national level. **Energy Policy** 149, 111942, 2021

J12. S Motaghian, S Rayegan, H Pasdarshahri, P Ahmadi. Comprehensive performance assessment of a solid desiccant wheel using an artificial neural network approach. **International Journal of Heat and Mass Transfer** 165, 120657, 2021.

J13. I Fakhari, P Behinfar, F Raymand, A Azad, P Ahmadi, E Houshfar, M Ashjaee. 4E analysis and tri-objective optimization of a triple-pressure combined cycle power plant with combustion chamber steam injection to control NO x emission. **Journal of Thermal Analysis and Calorimetry**, 1-17, 2021.

J14. A Habibollahzade, P Ahmadi, MA Rosen. Biomass gasification using various gasification agents: Optimum feedstock selection, detailed numerical analyses and tri-objective grey wolf optimization. **Journal of Cleaner Production** 284, 124718, 2021.

J15. Amir Keshavarzzadeh, Pouria Ahmadi. Multi-objective techno-economic optimization of a solar based integrated energy system using various optimization methods, ***Energy Conversion and Management*** 196, 196-210, 2019.

J16. E Gholamian, P Ahmadi, P Hanafizadeh, M Ashjaee, Dynamic feasibility assessment and 3E analysis of a smart building energy system integrated with hybrid photovoltaic-thermal panels and energy storage, **Sustainable Energy Technologies and Assessments**, 42, 100835, 2020.

J17. H Gharaei, P Ahmadi, M Ashjaee. Comparative lifecycle assessment of diesel, hydrogen and electric buses in real driving cycles in Tehran. **International Journal of Automotive Engineering** 10 (2), 3210-3226, 2020.

J18. MH Karimi, N Chitgar, MA Emadi, P Ahmadi, MA Rosen. Performance assessment and optimization of a biomass-based solid oxide fuel cell and micro gas turbine system integrated with an organic Rankine cycle. **International Journal of Hydrogen Energy** 45 (11), 6262-6277, 2020.

J19. E Gholamian, P Ahmadi, P Hanafizadeh, L Mazzarella. The use of waste heat recovery (WHR) options to produce electricity, heating, cooling, and freshwater for residential buildings. **Energy Equipment and Systems** 8 (3), 277-296, 2020.

J20. R Shahsavan Markadeh, A Arabkhalaj, H Ghassemi, P Ahmadi. 4-E analysis of heavy oil-based IGCC. **Energy Sources, Part A: Recovery, Utilization, and Environmental Effects** 42, 2020.

J21. S Changizian, P Ahmadi, M Raeesi, N Javani. Performance optimization of hybrid hydrogen fuel cell-electric vehicles in real driving cycles. **International Journal of Hydrogen Energy** 45 (60), 35180-35197, 2020.

J22. Z Li, S Khanmohammadi, S Khanmohammadi, AAAA Al-Rashed, P Ahmadi. 3-E analysis and optimization of an organic rankine flash cycle integrated with a PEM fuel cell and geothermal energy. **International Journal of Hydrogen Energy** 45 (3), 2168-2185, 2020.

J23. E Gholamian, P Ahmadi , P Hanafizadeh, , L Mazzarella, A transient optimization and techno-economic assessment of a building integrated combined cooling, heating and power system, **Energy Conversion and Management** 217, 112962, 2020.

J24. S Rayegan, S Motaghian, G Heidarinejad, H Pasdarshahri, P Ahmadi, M A Rosen. Dynamic simulation and multi-objective optimization of a solar-assisted desiccant cooling system integrated with ground source renewable energy. **Applied Thermal Engineering** 173, 115210, 2020.

J25. SM Alirahmi, SR Dabbagh, P Ahmadi, S Wongwises. Multi-objective design optimization of a multi-generation energy system based on geothermal and solar energy. **Energy Conversion and Management** 205, 112426, 2020.

J26. Pouria Ahmadi. Environmental impacts and behavioral drivers of deep decarbonization for transportation through electric vehicles, ***Journal of Cleaner Production***, 225, 1209-1219, 2019.

J27. A Pourahmadiyan, P Ahmadi, E Kjeang, Dynamic simulation and life cycle greenhouse gas impact assessment of CNG, LNG, and diesel-powered transit buses in British Columbia, Canada, **Transportation Research Part D: Transport and Environment** 92, 102724, 2021.

J28. A Azad, P Ahmadi, H Geshani, S Wongwises. Parametric study of an active magnetic refrigeration (AMR) system on exergy efficiency and temperature span with Gadolinium. **Journal of Thermal Analysis and Calorimetry**, 1-20, 2021.

J29. H Afsaneh, P Ahmadi, P Hanafizadeh, A Sattari. Numerical Investigation of Droplet Formation Mechanism in Various Two-phase Liquid-liquid Flow Regimes in Flow-focusing Microfluidic Devices. **Journal of Mechanical Engineering**, In Press, 2021.

J30. M El Hannach, P Ahmadi, L Guzman, S Pickup, E Kjeang. Life cycle assessment of hydrogen and diesel dual-fuel class 8 heavy duty trucks. ***International Journal of Hydrogen Energy*** 44 (16), 8575-8584, 2019.

J31. P Ahmadi, SH Torabi, H Afsaneh, Y Sadegheih, H Ganjehsarabi. The effects of driving patterns and PEM fuel cell degradation on the lifecycle assessment of hydrogen fuel cell vehicles. ***International Journal of Hydrogen,*** 45 (5), 3595-3608, 2020.

J32. M Ansari, A Beitollahi, P Ahmadi, B Rezaie. A sustainable exergy model for energy–water nexus in the hot regions: integrated combined heat, power and water desalination systems. **Journal of Thermal Analysis and Calorimetry**, 1-18, 2020.

J33. S Khanmohammadi, MM Baseri, P Ahmadi, AAAA Al-Rashed, M Afrand. Proposal of a novel integrated ocean thermal energy conversion system with flat plate solar collectors and thermoelectric generators: Energy, exergy and environmental analyses. **Journal of Cleaner Production** 256, 120600, 2020.

J34. Amir Keshavarzzadeh, Pouria Ahmadi, Mohammadreza Safaei. Assessment and optimization of an integrated energy system with electrolysis and fuel cells for electricity, cooling and hydrogen production using various optimization techniques. ***International Journal of Hydrogen Energy*** 44 (39), 21379-21396, 2019.

J35. H Jafari Mosleh, P Behnam, M Abbasi Kamazani, O Mohammadi, P Ahmadi, M A Rosen. A comprehensive comparative investigation on solar heating and cooling technologies from a thermo-economic viewpoint—A dynamic simulation. **Energy Science & Engineering**, In Press, 2020.

J36. H Montazerinejad, P Ahmadi, Z Montazerinejad. Advanced exergy, exergo-economic and exrgo-environmental analyses of a solar based trigeneration energy system. **Applied Thermal Engineering** 152, 666-685, 2019.

J37. MM Rastegardoost, S Heydari, P Ahmadi, K Abrinia. Simulation and Energy Performance Assessment of the Ghazal Solar-Electric Commercial vehicle in Tehran, Iran. **Automotive Science and Engineering** 9 (4), 3089-3099, 2019.

J38. M Nili Ahmadabadi, P Ahmadi, M Soleymani, SA Atyabi, M Hadad. Environmental Impact Assessment of replacing Conventional Taxis with Hybrid Electric Vehicles in Tehran, Iran. **Automotive Science and Engineering** 9 (4), 3125-3131, 2019.

J39. A Habibollahzade, E Houshfar, P Ahmadi, A Behzadi, E Gholamian. Exergoeconomic assessment and multi-objective optimization of a solar chimney integrated with waste-to-energy. **Solar Energy** 176, 30-4, 2018.

J40. A. Habibollahzadeh, E. Gholamian, P. Ahmadi, A. Behzadi. Multi-Criteria Optimization of an Integrated Energy System with Thermoelectric Generator, Parabolic Trough Solar Collector and Electrolysis for Hydrogen Production. *In Press*, ***International Journal of Hydrogen Energy***, 43 (31), 14140-14157, 2018.

J41. A Behzadi, A Habibollahzade, P Ahmadi, E Gholamian, E Houshfar. Multi-objective design optimization of a solar based system for electricity, cooling, and hydrogen production. ***Energy*** 169, 696-709, 2018.

J42. P Ahmadi, B Rezaie. Work Availability and Exergy Analysis. **Entropy** 20 (8), 597, 2018.

J43. E Gholamian, P Hanafizadeh, P Ahmadi. Exergo-economic analysis of a hybrid anode and cathode recycling SOFC/Stirling engine for aviation applications. **International Journal of Sustainable Aviation** 4 (1), 11-30, 2018.

J44. A Behzadi, E Gholamian, P Ahmadi, A Habibollahzade, M Ashjaee. Energy, exergy and exergoeconomic (3E) analyses and multi-objective optimization of a solar and geothermal based integrated energy system. **Applied Thermal Engineering** 143, 1011-1022, 2018.

J45. E Gholamian, P Hanafizadeh, A Habibollahzade, P Ahmadi. Evolutionary based multi-criteria optimization of an integrated energy system with SOFC, gas turbine, and hydrogen production via electrolysis. **International Journal of Hydrogen Energy** 43 (33), 16201-16214, 2018.

J46. M Moghimi, M Emadi, P Ahmadi, H Moghadasi. 4E analysis and multi-objective optimization of a CCHP cycle based on gas turbine and ejector refrigeration. ***Applied Thermal Engineering,*** 141:516-530, 2018.

J47. A Habibollahzade, E Gholamian, P Ahmadi. Energy and exergy assessment of solar chimney power plants: An analytical modeling. **Journal of Solar Energy Research** 3 (1), 75-79, 2018.

J48. Pouria Ahmadi, Ximing Cai, Madhu Khanna. Multi-criteria Optimal Electric Drive Vehicle Selection based on Life cycle Cost and Emission, Accepted, ***International Journal of Energy Research***, 42(4) 1496-1510, 2018, (IF=2.6, #1).

J49. E Gholamian, P Hanafizadeh, P Ahmadi. Advanced exergy analysis of a carbon dioxide ammonia cascade refrigeration system. ***Applied Thermal Engineering*** 137, 689-699, 2018.

J50. Pouria Ahmadi, Erik Kjeang. Realistic simulation of fuel economy and life cycle metrics for hydrogen fuel cell vehicles**.** ***International Journal of Energy Research***, 41 (5), 714-727, 2017.

J51. P Ahmadi, MH Nazari, SH Hosseinian. Optimal resources planning of residential complex energy system in a day-ahead market based on invasive weed optimization algorithm. **Engineering, Technology & Applied Science Research** 7 (5), 1934-1939, 2017.

J52. Pouria Ahmadi, Erik Kjeang. Comparative life cycle assessment of hydrogen fuel cell passenger vehicle in different Canadian provinces. ***International Journal of Hydrogen Energy,*** 40(38): 12905-12917, 2015.

J53. P Ahmadi, HS Hamut, A Ghaffarizadeh, P Hanafizadeh , Exergetic Optimization of Power Generation Systems, E Ghasemisahebi, ***International Journal of Chemical Engineering***, 2016.

J54. Pedram Hanafizadeh, MM Siahkalroudi, Pouria Ahmadi**,** Experimental and numerical investigation of optimum design of semi industrial heat recovery steam generator inlet duct. ***Applied Thermal Engineering***, 104, 375-385, 2016.

J55. P Hanafizadeh, J Eshraghi, P Ahmadi, A Sattari , Evaluation and sizing of a CCHP system for a commercial and office buildings. **Journal of Building Engineering** 5, 67-78, 2016.

J56. S Javan, V Mohamadi, P Ahmadi, P Hanafizadeh, Fluid selection optimization of a combined cooling, heating and power (CCHP) system for residential applications, ***Applied Thermal Engineering*** 96, 26-38, 2016.

J57. A Momeni, P Ahmadi, HS Hamut, M Ashjaee, Thermo-economic assessment of three-stage combined cycle power system using ammonia-water mixture, **Mechanics & Industry** 17 (5), 502, 2016.

J58. P Hanafizadeh, A Sattari, SE Hosseinidoost, A Irannezhad, P Ahmadi , Wind resource assessment of Khuzestan province in Iran, **Energy Equipment and Systems** 4 (2), 81-94, 2016.

J59. SE Hosseinidoost, A Sattari, M Eskandari, D Vahidi, P Hanafizadeh, P Ahmadi. Techno-economy study of wind energy in Khvaf in Razavi Khorasan Province in Iran. **Journal of Computational Applied Mechanics** 47 (1), 53-66, 2016.

J60. P Ahmadi, HS Hamut, A Ghaffarizadeh, P Hanafizadeh, E Ghasemisahebi. Exergetic optimization of power generation systems. **International Journal of Chemical Engineering** 2016.

J61. SE Hosseinidoost, A Sattari, M Eskandari, P Hanafizadeh, P. Ahmadi. Techno-Economy Study of wind energy in Khvaf in Razavi Khorasan Province in Iran. **Journal of Computational Applied Mechanics** 47 (1), 53-66, 2016.

J62. Azim Keshtkar, Fazel Keshtkar, Pouria Ahmadi. Smart residential load reduction via fuzzy logic, wireless sensors, and smart grid incentives. ***Energy and Buildings***, 104(1):165-180, 2015.

J63. MA Ehyaei, M Tahani, P Ahmadi, M Esfandiari. Optimization of fog inlet air cooling system for combined cycle power plants using genetic algorithm. **Applied Thermal Engineering** 76, 449-461, 2015.

J64. Pouria Ahmadi, Ibrahim Dincer, Marc A. Rosen. Transient thermal performance assessment of a hybrid solar-fuel cell based system in Toronto, Canada. ***International Journal of Hydrogen Energy***, 40(24): 7846-7854, 2015.

J65. S Javan, P Ahmadi, H Mansoubi, MNM Jaafar. Exergoeconomic based optimization of a gas fired steam power plant using genetic algorithm. **Heat Transfer—Asian Research** 44 (6), 533-551, 2015.

J66. Pedram Hanafizadeh, Sajjad Falahatkar, Pouria Ahmadi. A Novel Method for Inlet Duct Geometry Improvement of Heat Recovery Steam Generators. ***Applied Thermal Engineering***, 89: 125-133, 2015.

J67. Pouria Ahmadi, Ibrahim Dincer, Marc A. Rosen. Multi-objective Optimization of a Hybrid Ocean Thermal Energy Conversion System for Hydrogen Production. ***International Journal of Hydrogen Energy***, 40(24):7601-7608, 2014.

J68. A Ganjehkaviri, MNM Jaafar, P Ahmadi, H Barzegaravval. Modelling and optimization of combined cycle power plant based on exergoeconomic and environmental analyses. **Applied Thermal Engineering** 67 (1-2), 566-578, 2014.

J69. Pouria Ahmadi, Ibrahim Dincer, Marc A Rosen. Performance assessment of a novel solar and ocean thermal energy conversion based multigeneration system for coastal areas. ***ASME Journal of Solar Energy Engineering***, 137(1), 011013, 2014.

J70. M Tahani, T Sokhansefat, K Rahmani, P Ahmadi. Aerodynamic optimal design of wind turbine blades using genetic algorithm. **Energy Equipment and Systems** 2 (2), 185-193, 2014.

J71. P Sindareh-Esfahani, A Ghaffari, P Ahmadi. Thermodynamic modeling based optimization for thermal systems in heat recovery steam generator during cold start-up operation. **Applied thermal engineering** 69 (1-2), 286-296, 2014.

J72. A Jamali, P Ahmadi, MNM Jaafar. Optimization of a novel carbon dioxide cogeneration system using artificial neural network and multi-objective genetic algorithm. **Applied Thermal Engineering** 64 (1-2), 293-306, 2014.

J73. Pouria Ahmadi, Ibrahim Dincer, Marc A Rosen. Multi-objective optimization of a novel solar-based multigeneration energy system. ***Solar Energy***, 108, 576–591, 2014.

J74. Pouria Ahmadi, Ibrahim Dincer, Marc A. Rosen. Thermo-economic multi-objective optimization of a novel biomass-based integrated energy system. ***Energy***, 68:958-970, 2014.

J75. Arash Jamali, Pouria Ahmadi. Optimization of a CO_2 combined cycle using artificial neural network and multi-objective genetic algorithm. ***Applied Thermal Engineering*** 64(1): 293-306, 2013.

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J77. Pouria Ahmadi, Ibrahim Dincer, Marc A. Rosen. Performance assessment and optimization of a novel integrated multigeneration system for residential buildings. ***Energy and Buildings***, 2013, 67:568-578.

J78. Pouria Ahmadi, Ibrahim Dincer, Marc A. Rosen. Development and assessment of an integrated biomass-based multi-generation energy system. ***Energy***, 56: 155-166, 2013.

J79. Mehdiali Ehyaei, Pouria Ahmadi, Farhad Atabi, Mohammadreza Heibati, Mohammad Khorshidvand. Feasibility study of applying internal combustion engines in residential buildings by exergy, economic and environmental analysis. ***Energy and Buildings***, 55, 405-413, 2012.

J80. Pouria Ahmadi, Ibrahim Dincer, Marc A. Rosen. Energy and exergy analyses of hydrogen production via solar-boosted ocean thermal energy conversion and PEM electrolysis. ***International Journal of Hydrogen Energy*, 2012**, 8(4), 1795-1805, 2014.

J81. Mehdi Hosseini, Ibrahim Dincer, Pouria Ahmadi, Hasan Barzegar Avval, Masoud Ziaasharhagh. Thermodynamic modeling of an integrated solid oxide fuel cell and micro gas turbine system for desalination purposes. ***International Journal of Energy Research*** (IJER), 37:426–434, 2013.

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J85. Mohammad Tajik Mansouri, Pouria Ahmadi, Abdolsaeid Ganjeh Kaviri, Mohammad Nazri Mohd Jaafar. Exergetic and economic evaluation of the effect of HRSG configurations on the performance of combined cycle power plants. ***Energy Conversion and Management***, 58:47–58, 2012.

J86. MA Abdous, HB Avval, P Ahmadi, N Moallemi, I Dincer. Analysis of transient heat conduction in a hollow sphere using Duhamel theorem. **International Journal of Thermophysics** 33 (1), 143-159, 2012.

J87. M. Ghazi, P. Ahmadi, A. F Sotoodeh, A. Taherkhani. Modeling and thermo-economic optimization of heat recovery heat exchangers using a multimodal genetic algorithm. ***Energy Conversion and Management***, 58:149–156, 2012.

J88. P Ahmadi, A Almasi, M Shahriyari, I Dincer. Multi-objective optimization of a combined heat and power (CHP) system for heating purpose in a paper mill using evolutionary algorithm. **International Journal of Energy Research** 36 (1), 46-63, 2012.

J89. H Ghaebi, MH Saidi, P Ahmadi. Exergoeconomic optimization of a trigeneration system for heating, cooling and power production purpose based on TRR method and using evolutionary algorithm. Applied thermal engineering 36, 113-125, 2012.

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J91. Pouria Ahmadi, Marc A. Rosen, Ibrahim Dincer. Greenhouse gas emission and exergo-environmental analyses of a trigeneration energy system. ***International Journal of Greenhouse Gas Control***, 5 (6):1540-1549, 2011.

J92. Pouria Ahmadi, Ibrahim Dincer, Marc A. Rosen. Exergy, exergoeconomic and environmental analyses and evolutionary algorithm based multi-objective optimization of combined cycle power plants. ***Energy***, 36(10):5886-5898, 2011.

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J94. Hasan Hajabdollahi, Pouria Ahmadi, Ibrahim Dincer. Exergetic optimization of shell and tube heat exchangers using NSGAII. ***Heat Transfer Engineering***, 33 (7): 618-628, 2012.

J95. Pouria Ahmadi, Ibrahim Dincer. Thermodynamic and exergoenvironmental analyses, and multi-objective optimization of a gas turbine power plant. ***Applied Thermal Engineering Journal***, 31:2529-2540, 2011.

J96. P Ahmadi, I Dincer, H Hajabdollahi. Multi-Objective Optimization of Plain Fin-and-Tube Heat Exchanger Using Evolutionary Algorithm. **Journal of Thermophysics and Heat Transfer** 25 (3), 424-431, 2011.

J97. Pouria Ahmadi, Ibrahim Dincer. Thermodynamic modeling and thermo-economic optimization of a dual Pressure Combined cycle Power Plant with supplementary firing using evolutionary algorithm. ***Energy Conversion and Management***, 52:2296-2308, 2011.

J98. Hasan Hajabdollahi, Pouria Ahmadi, Ibrahim Dincer. Thermoeconomic optimization of a shell and tube condenser using both genetic algorithm and particle swarm. ***International Journal of Refrigeration***, 34:1066-1076, 2011.

J99. Hasan Hajabdollahi, Pouria Ahmadi, Ibrahim Dincer. An Exergy-Based Multi Objective Optimization of a Heat Recovery Steam Generator (HRSG) in a Combined Cycle Power Plant (CCPP) using Evolutionary Algorithm. ***International Journal of Green Energy*** *(IJGE)*, 8: 44–64, 2011.

J100. H. Barzegar Avval, P. Ahmadi, A. R. Ghaffarizadeh, M. H. Saidi. Thermo-Economic- environmental Multi-Objective Optimization of a Gas Turbine Power Plant with Preheater Using Evolutionary Algorithm. ***International Journal of Energy Research (IJER)***, 35:389–403, 2011.

J101. P. Ahmadi, I. Dincer, Thermodynamic analysis and thermoeconomic optimization of a dual pressure combined cycle power plant with a supplementary firing unit. ***Energy Conversion and Management,*** 52 (5), 2296-2308, 2011.

J102. Pouria Ahmadi, Hasan Hajabdollahi, Ibrahim Dincer. Cost and Entropy generation minimization of a cross flow Plate-Fin Heat Exchanger (PFHE) using Multi-Objective genetic algorithm. ***ASME Journal of Heat Transfer***, 133 (2), art. no. 021801, 2011.

J103. Pouria Ahmadi, Ibrahim Dincer. Exergoenvironmental analysis and optimization of a cogeneration plant system using multimodal genetic algorithm. ***Energy***, 35:5161-5172, 2010.

J104. Mohammad Ameri, Pouria Ahmadi, Armita Hamidi. Energy, exergy and exergoeconomic analysis of a steam power plant (A case study). ***International Journal of Energy Research (IJER)***, 33:499–512, 2009.

J105. M. Ameri, P. Ahmadi, S. Khanmohammadi. Exergy Analysis of a 420 MW Combined Cycle Power Plant. ***International Journal of Energy Research (IJER)***, 32:175–183, 2007.

Selected Conference Paper

C1. Pouria Ahmadi, Nader Javani, Alireza Khoshnevisan. Enviro-economical Assessment of Hydrogen Fuel Cell Buses with degradation prediction. 12th International Exergy, Energy and Environment Symposium, Hamad Bin Khalifa University, Qatar, December 2020.

C2. Pouria Ahmadi, Erik Kjeang. Life Cycle Assessment of Transit Buses in British Columbia, Canada: Comparison of Diesel, Hydrogen and Liquefied Natural Gas Fuels. *ASME Power and Energy Conference*, 2015. San Diego, California, June 28-July 2nd.

C3. Pouria Ahmadi, Ibrahim Dincer, Marc A. Rosen. Exergy Analysis and Optimization of an Air-to Water Heat Pump Using a Genetic Algorithm. *In Proceedings of 11th International Conference on Sustainable Energy Technologies (SET-2012)*, Vancouver, BC, Canada.

C4. M. Ameri, M. Karimi, P. Ahmadi. Energy and Exergy Analysis of a Gas Turbine Power Plant with Inlet Evaporating Cooling Systems. *In Proceedings of Energy Cost Optimization and Simulation (ECOS) 2010 conference, 14-17 June 2010, Lausanne, Switzerland.*

C5. F. Roshanghalb, R. Jahanbakhshi, A. R. Ghahremani, P. Ahmadi, M. H. Saidi. Optimization of pulse tube refrigerators considering prominent operation parameters using evolutionary algorithms. *In Proceedings of The 11th Cryogenics 2010 - IIR International Conference*, 26-29 April, 2010, Bratislava, Slovakia.

C6. Mohammad Ameri, Vahid Bayanati, Pouria Ahmadi. Thermodynamic Modeling and Simulation of a Slide Pressure Thermal Power Plant at Partial Loads. *In Proceedings of ICREAT*, 2009, Malaysia.

C7. M.R. Meigonpouri, P. Ahmadi, A.R.Ghaffarizadeh, S. Khanmohammadi. Optimization of Combined Cycle Power Plant Using Sequential Quadratic Programming. *In Proceedings of 2008 ASME Summer Heat Transfer Conference*, HT2008-56129, 2008, Florida USA.

C8. M. Ameri, P. Ahmadi. The Study of Ambient Temperature Effects on Exergy Losses of a Heat Recovery Steam Generator. *In Proceedings of International Conference on Power Engineering*, 2007, October 23-27, 2007, Hangzhou, China, 55-61.

Dissertations

- ✓ Ahmadi P., 2013. Modeling, analysis and optimization of integrated energy systems for multigeneration purposes, Ph.D. dissertation, Ontario Tech University, Canada.
- ✓ Ahmadi P., 2009. Thermodynamic modeling and techno-economic multi-objective optimization of an actual combined cycle power plant, M.Sc. dissertation, Iran University of Science and technology (IUST), Iran.
- ✓ Ahmadi P., 2006. Design, optimization and installation of supplementary firing unit into the inlet duct of an industrial V94.2 gas turbine HRSG: Performance Assessment, BSc. Final Project, Shahid Beheshti University, Iran.

EDITORIAL RESPONSIBILITY

- **Guest Editor:**
  - Sustainable Energy Technology and Assessment (SETA), Elsevier, IF: 3.45
  - Applied Thermal Engineering (ATE), Elsevier, IF: 4.72
  - Journal of Thermal Analysis and calorimetry (JTAC), Springer, IF: 2.72
  - International Journal of Chemical Engineering, Hindawi, IF:1.87
- **Editorial Board Member:**
  - Entropy Journal, MDPI, IF: 2.49
  - Energies Journal, MDPI, IF: 2.71
  - Journal of Thermal Engineering, IF:0.8
  - International Journal of Sustainable Aviation
  - Energy Equipment and Systems (EES)

AWARDS, HONORS AND RECOGNITIONS

- Young researcher award, University of Tehran, 2020.
- First place winner for the best Capstone project for my undergraduate student at School of Mechanical Engineering, University of Tehran. 2020.
- Winner of the Community Trust Endowment Postdoctoral Fellowship, Simon Fraser University (SFU), Vancouver, Canada, $55 k per year, 2015.
- Winner of the Pacific Institute of Climate solution (PICS) postdoctoral award r, Vancouver, Canada, $50k per year, 2014.
- Winner of the Postdoctoral research fellow assistantship award for one year (I declined the offer). Department of Mechanical Engineering, University of Alberta, Edmonton, Alberta, Canada, $50k pear year, August 2014.
- Winner of Postdoctoral research fellow assistantship award for one year (I declined the offer). Department of Mechanical Engineering, Colorado State University (CSU), USA $55k pear year, August 2015.
- Postdoctoral fellow assistantship award for two years (I declined the offer), Future Energy Center, KTH and Malardalen University, Sweden, $80k per year, 2014.

- Postdoctoral research fellowship Award (I declined the offer), University Technology Malaysia, $ 40k per year, January 2014.
- Best paper award prize, 2nd place, Ontario Tech. 4th Annual Graduate Student Research Conference, May 2013, Ontario Tech University, Oshawa, Ontario, Canada
- Ontario Tech University Dean's Graduate Scholarship award ($18000) - Doctoral Level, Office of Graduate Studies. 2009-2013
- Graduate Study Scholarship (NSERC), $55000 CAD for four years.

GRANTS & PROPOSALS

Funded Grants/Contracts

- 2021. MAPFAN research center, College of Engineering, University of Tehran, Tehran, Iran. Development of an in-house life cycle assessment software for the replacement of passenger vehicles and public buses in Tehran with electric vehicles and electric buses. ($ 40000 USD), one year, PI, **Ongoing**, 2021.
- 2020. UNDP and Sharif Energy Research Institute (SERI), Tehran, Iran. Energy consumption optimization in buildings and increasing public awareness level in the building sector. Series of 12 workshops each consists of five various talks at 12 different cultural centers in Tehran, Iran. ($75000 USD), one year, Co-PI.
- 2019. Tarbiat Modares University and SATBA, Tehran, Iran. Development of an Energy Flow Audit software for Iran Oil Ministry. ($ 30000 USD), one year, Co-PI.
- 2019. MAPFAN research center, College of Engineering, University of Tehran. Heat exchanger area optimization of a combined cycle power plant HRSG using evolutionary algorithms, ($ 15000 USD), 6 month, PI.
- 2018. Strategic Research Initiative fund at University of Illinois, USA. Quantifying Water-Related Electricity Grid Dynamics in Response to Widespread Use of Electric Vehicles. ($50000 USD) for one year), Co-PI.
- 2016. NSERC Engagement Grant with Hydra Energy Corporation as industrial partnership. Modeling the Lifecycle Emissions and Cost of Class 8 Heavy Duty Trucks Converted to Waste Hydrogen Fuel. ($25000 CAD) for six month, Co-PI.
- 2015. Community Trust Endowment Fund (CTEF), Mechatronic System Engineering Department, Simon Fraser University (SFU). Developing affordable low-carbon emission vehicle technologies to meet climate goals: A social, economic, and technical analysis of the market and public policy ($1000000 CAD) for four years, Co-PI.
- Proposal for Summer Course on "Exergy and Its Applications for Better Environment and Sustainability". Contribution with *UOIT and Mitacs*, ($70000 CAD), May 2012, **Finished.**
- Pre-Feasibility study and scaling up the high view power storage liquefaction technology for Ontario, Canada. ($40000 CAD). Joint Proposal of Ontario tech University and University of Western Ontario, September 2012, **Finished.**

Submitted proposals

- Design Optimization of a Zero Energy/Emission Buildings for Smart Energy Systems, a Case study. Niro Research Institute and MAPFAN research center, Tehran, Iran, ($ 7000000 USD), PI, **Under-review**, 2021.

INVITED TALKS/WORKSHOPS/WEBINARS

- **The role of Hydrogen for Future Smart Energy Systems, Online talk.** Aalborg University, Denmark, Online talk, December 2020.
- **The role of Electric Vehicles for Emission Reduction, A social, economic, and technical analysis of the market and public policy**. Niro Research Institute (NRI), Tehran, Iran, May 2018.

- **Recent Advances in Energy Research Technologies.** First National Conference on Innovative Ideas on Sustainable Energies. Razi University, Kermanshah, Iran, May 2018.
- **Developing Affordable Low-Carbon Emission Vehicle Technologies to Meet Climate Goals A social, economic, and technical analysis of the market and public policy.** Department of Energy Engineering, Sharif University of Technology, Tehran, Iran, November 2018.
- **The Role of Hydrogen Fuel Cell and Electric Vehicles Degradation on the Life Cycle Metrics for Sustainable Transportation.** Department of Mechanical Engineering, University of Tabriz, Iran, November 4th, 2018.
- **Life Cycle Fuel Cell Durability with Cerium Oxide Under Membrane Degradation.** Department of Mechanical Engineering, Wichita State University, USA, April 4th, 2017.
- **The Effect of Fuel Cell Degradation on the Life Cycle Metrics for Hydrogen Fuel Cell Vehicles,** Department of Mechanical Engineering, Cleveland State University, Ohio, USA, March 30th, 2017.
- **The Effect of Fuel Cell Degradation on the Life Cycle Metrics for Hydrogen Fuel Cell Vehicles,** Department of Mechanical Engineering, Purdue University, Indiana, USA, March 20th, 2017.
- **The Role of Advanced Energy Systems Optimization for Sustainable Development.** Department of Mechanical Engineering, *University of New Mexico*, Albuquerque, April, 2016.
- **PEM Fuel Cell Applications with Enhanced Durability.** Workshop on Exergy, Energy and Environmental Impacts, Department of Mechanical Engineering, *University of Tehran*, April, 2016.
- **Exergy based multi-objective optimization.** Workshop on Exergy, Energy and Environmental Impacts, Department of Mechanical Engineering, *University of Tehran*, April, 2016.
- **Life Cycle Assessment (LCA) of Hydrogen Fuel Cell Vehicles with Degradation Model.** Department of Mechanical Engineering, *Florida State University (FSU)*, March 1st, Tallahassee2016.
- **The Role of Advanced Energy system's Optimization for Better Sustainability.** *National Iranian Productivity Organization*, Tehran, Iran, September 13, 2015.
- **Recent Advances in Energy Technologies**. *Ministry of Energy*, Tehran, Iran, September 14, 2015.
- **How to Write Scientific Research Journal Papers**. Department of Energy Engineering, *Sharif University of Technology*, Tehran, Iran, September 7, 2015.
- **The Role of Advanced Energy system's Optimization for Better Sustainability.** Department of Mechanical Engineering, *University of Tehran*, Tehran, Iran, September 1st, 2015.
- **Life Cycle Assessment of Energy Systems.** *2nd International Conference and Exhibition of Solar Energy*, Tehran, Iran 30-31 August 2015.
- **Buildings of the Future,** *ASME 2015 Power & Energy Conference*, San Diego, California, USA
- **Moving Towards Sustainable Transportation.** Mechatronic System Engineering, *Simon Fraser University (SFU)*, Vancouver, Canada, June 19, 2015.
- **Zero Energy Community in Canada for Better Environment.** *BIT's 3rd Annual International Symposium of Clean Coal Technology*, September 16-18, China.
- **Sustainable Energy Solutions for Better Future.** Department of Energy Engineering, *Aalto University*, Helsinki, Finland. June 12, 2014.
- **Optimization of Advanced Energy Systems for Better Sustainability**. Department of Engineering and Computer Science, *Concordia University*, Montreal, Canada, Feb 17, 2014.
- **Advances in Net Zero Energy Buildings**. Department of Mechanical Engineering, *University Technology Malaysia (UTM)*, Johor, Malaysia, 19 December 2013.
- **CHP and its Application for Residential Buildings**. *Amid Development Management Consultants Company*, Tehran, Iran, July 6th, 2012.
- **Exergy Based Multi Objective Optimization.** Summer Course on Exergy and its application for better sustainability. *University of Ontario Institute of Tec*hnology (UOIT), Oshawa, Ontario, Canada, April 30-May 4, 2012.
- **Application of Genetic Algorithm in Engineering Optimization**. *Iran University of Science and Technology (IUST)*, Tehran, Iran, March 2009.

PROFESSIONAL TRAINING

2020	Teaching and learning II: Course Development. College of Engineering, University of Tehran
2020	Teaching and Learning I, Participatory learning. College of Engineering, University of Tehran
2014	Essentials of Productive Teams, Mitacs, Canada
2014	Instructional Skills Workshop (ISW), Simon Fraser University (SFU), Canada
2014	Presentation skills workshop, SFU
2013	ISO14001, Internal Auditor Course, SGS
2013	Workplace Hazardous Materials Information System (WHIMIS), Canada
2012	Exergy for better Environment and Sustainability, UOIT & Mitacs, Canada
2008	Piping Course Certificate, Mehras Consulting Co, Iran

PROFESSIONAL MEMBERSHIP:

- American Society of Mechanical Engineering (ASME).
- World Society of Sustainable Energy Technologies (WEST).
- Iranian Society of Mechanical Engineering (ISME).

PEDAGOGY OF UNIVERSITY TEACHING

Instructional Skills Workshop (ISW) certificate

Simon Fraser University (SFU), Canada *Dec. 2014 to Jan 2015*

- The ISW certificate is two month compact program designed to help graduate students and postdoctoral fellows to prepare for a career involving university teaching. The program provides graduate students with the opportunity to expand their knowledge of the pedagogy of teaching through a set of workshops, a practicum component with feedback from peer reviewers, and preparation of a teaching dossier.

Teaching and learning Methods

Ontario Tech University, Canada December 2012

- This course is a useful course for PhD students for their future career and for TAs. It discusses fundamental concepts in pedagogy, including course instructional design, the methods of assessment, different teaching and learning styles, participatory learning methods, and developing learning objectives. The course also introduces the participants to developing a teaching portfolio for a university course.

SERVICE

Field

- Proposal reviewer, INSF, Iran, 2020.
- Book reviewer for Elsevier and John Wiley, 2017-Present.
- Journal paper reviewer. More than 250 papers reviewed for almost 40 journals, 2007- Present.
- Session Chair for Energy and Sustainability, 12th International Conference on Energy Sustainability June 24-28. Florida. 2018.
- Session chair for Environmental, Economic and Policy Consideration of Advanced Energy Systems. ASME 2017, 11th International Conference on Energy Sustainability, Charlotte, NC, June 27-29, 2017,
- Session chair for Environmental, Economic and Policy Consideration of Advanced Energy Systems. 10th International Conference on Energy Sustainability, Charlotte, NC, June 26-30, 2016.
- Panel Organizer for Energy Systems for Buildings of the Next Century. 2015 Power & Energy Conference, San Diego, California, USA, 2015.
- Session chair for Integrated/Sustainable Building Equipment and Systems, ASME 2015 Power & Energy Conference, San Diego, California, USA,

- Session chair for Alternative Energy Technologies, ASME 2014 International Mechanical Engineering Congress and Expositions, Montreal, Canada, 2014.
- Workshop Coordinator, Smart Energy Systems Workshop, University of Tehran, Iran, 2020.
- Workshop Coordinator, Hydrogen Energy for Sustainability, University of Tehran, Iran, 2020.
- Scientific Organizing Committee Member, Exergy Summer Course, Oshawa, Ontario, Canada, April 2011.
- Scientific Organizing Committee Member, 11th International Conference on Sustainable Energy Technologies (SET-2012), Vancouver, BC, Canada.
- Scientific Organizing Committee Member, International Conference on Clean Energy 2014. Istanbul, Turkey, June 2014.

University

- Head of the Engineering Skill Development Center (ESDC), College of Engineering, University of Tehran, 2019-Present.
- Head of the Scientific Association of Mechanical Engineering at College of Engineering, University of Tehran, 2019-Present.
- ME Graduate Committee Member, 2018, 2019, 2010.
- Judge for Capstone Fair April 2019, 2020.
- ME search committee member, 2020.
- Head of the Green Building group at School of Mechanical Engineering, University of Tehran, 2019-Present.