## *CONTACT INFORMATION*

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## *RESEARCH INTERESTS*

My research primarily focuses on developing cutting-edge modeling and experimental methodologies for addressing challenges with building energy conservation and improving energy efficiency for design, performance and operation of building energy systems. Application domain includes building energy management, thermal comfort, indoor air quality, smart sensing and control systems, and grid-interactive district energy and combined heat and power systems.

## *ACADEMIC BACKGROUND*

01.2017 – 2022 **Ph.D. Civil, Architectural and Environmental Engineering, Building Energy & Environment (BEE) Program, University of Texas at Austin, USA**
Thesis: Indoor and Outdoor Radiant Cooling Systems for Buildings
Advisor: Professor Atila Novoselac

10.2013 – 01.2016 **M.Sc. Mechanical Engineering (Energy Conversion), K. N. Toosi University of Technology, Iran**
Thesis: Analysis of optimal design parameters in building energy consumption with optimization methods and inverse analysis
Advisor: Professor Cyrus Aghanajafi

02.2010 – 12.2012 **B.Sc. Mechanical Engineering (Heat & Fluids), Islamic Azad University, Iran**
Thesis: Numerical modeling of HVAC system design at Hospitals
Advisor: Professor Hamid Rastegari

10.2007 – 07.2009 **A.Sc. Installations-Central Heating and Air Conditioning Technology, Enghelab Eslami Technical and Vocational University, Iran**

10.2004 – 06.2007 **Diploma. Heating, Ventilation & Air Conditioning Technology, Azadi Felestin Technical and Vocational High School, Iran**

## *RESEARCH WORK EXPERIENCE*

### PhD Research Assistant

Center for Energy & Environmental Resources (CEER),
University of Texas at Austin, TX, USA

10.2020 – Present

**Optimal Co-Design of Integrated Thermal-Electrical Networks and Control Systems for Grid-interactive Efficient District (GED) Energy Systems**

Sponsored by U.S. Department of Energy (DOE), a collaborative project between three universities (CU Boulder, UT Austin, RPI) and two DOE national labs (LBNL, NREL)
(Total Value at ~ $4.16M, Awarded 10/2020, Ongoing)
(PI: Wangda Zuo, Co-PIs: Kyri Baker, Michael Wetter, Kyle Benne, Luigi Vanfretti, Atila Novoselac, and Raymond Kaiser) (**My Role: Lead Researcher for UT Austin Team**)

- Development of smart thermal-electrical networks and control systems for optimal design of grid-interactive efficient district (GED) combined heat and power (CHP) energy systems, particularly for integration of intermittent renewable energy resources (Solar PV, Wind) to maintain resiliency and autonomy of the microgrid.
- Creating a holistic open-source modeling platform for optimal design and retrofit of GED energy systems using National Renewable Energy Laboratory (NREL)'s URBANopt and Lawrence Berkeley National Laboratory (LBNL)'s Modelica Building Library (MBL) platforms.
- Demonstration of the optimal co-design model platforms at two real-world DE/microgrid testbeds at UT Austin and CU Boulder, and evaluation of the optimization scheme and energy saving by implementing smart grid-interactive energy systems.
- Leading the effort on behalf of UT Austin team for technical data collection and analysis for UT Campus Energy Plant, and using MBL for modeling CHP components (chillers, steam boilers, turbines, heat recovery steam generators, solar PV, electric vehicles).

09.2019 – 03.2021
**SBIR Phase II: Passive Radiative Composite Material**
Sponsored by National Science Foundation (NSF-1831805) in collaboration with PC Krause and Associates, Inc. (Total Value at ~ $798K, Awarded 09/2018, Completed) (PI: Alex Heltzel) (**My Role: Lead Researcher, Co-Author of Proposal on Behalf of UT Austin Team**)

- Application of passive radiant cooling (PRC) composite to create an ultra-cool metal roofing intended to reduce heat transfer into the building, lower daytime peak load and energy costs associated with the building air conditioning.
- Leading technical design of twin test chambers with interchangeable roof assemblies and installations of measuring instrumentations and data acquisition systems at UT roof testing laboratory (RTL).
- Development of a comprehensive experimental setup for large-scale metal roof testing, and leading the campaign for executing a set of full-scale experiments to evaluate thermal performance of PRC-based roofing in comparison with other commercially available metal roofing (e.g., 30-gauge galvanized steel corrugated panels, FABRAL heavy-gauge galvanized steel, and FABRAL bone white cool roofs) under realistic environmental conditions.
- Development of new sky radiation models for energy analysis of PRC systems and implementation of PRC surfaces in the state-of-the-art building energy modeling software (EnergyPlus) for different roofing applications (e.g., residential, commercial, warehouses, supermarkets and retail stores).

10.2020 – 01.2021
**Microbial VOC Analysis for Mold Growth from Air Conditioning Ductwork**
A pilot research study following up to AP Sloan Foundation's Chemistry of Homes – Environmental Microbe and Moisture (CHEMM) project in collaboration with Misztal Sniffer Lab at UT Austin (**My Role: Lead Researcher**)

- Exploring microbial VOC (mVOC) emission from fungi and bacteria, and understanding their role in indoor air quality (IAQ) and human health.
- Planning and executing full-scale experiments for real-time detection of mVOCs from HVAC ducts through proton transfer reaction time-of-flight mass spectrometry (PTR-TOF-MS), and measuring emission rates as a function of temperature, humidity, air change rates, and source strength from different HVAC duct materials.
- Quantify mold growth on the HVAC ducts per microbial cell or gene copy using quantitative polymerase chain reaction (qPCR).

10.2018 – 07.2019
**Enhancements in Cooling Capacity and Control of Hydronic Radiant Systems by Optimizing Panel Geometry (Sanken panels) & Elevating Air Movement (with Ceiling fans)**
Sponsored by Sanken Setsubi Kogyo Co., Ltd. in collaboration with Center for the Built Environment (CBE) at University of California at Berkeley
(Total Value at ~ $15K, Awarded 11/2018, Completed)
(PIs: Ippei Izuhara and Jovan Pantelic) (**My Role: Lead Researcher**)

- Examining the role of convection in enhancing cooling capacity of radiant panel systems when combined with fan-induced advection.
- Leading full-scale experiments for measuring surface convection coefficients, and development of new convection correlations for rooms with ceiling fan and radiant panel systems.
- Conducting full-scale experimental measurements for evaluating cooling performance of perforated Sanken radiant panels (with curvature) in comparison with conventional flat radiant panels, and developing system capacity curves for sizing Sanken panels.

05.2018 – 09.2018
**Improvements in the Operative Temperature Controller for Radiant Cooling Panels**
Sponsored by The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) research Grant-In Aid (GIA) Fellowship.
(Total Value at ~ $10K, Awarded 05/2018, Completed) (**My Role: Lead Author of Proposal**)

- Planning and executing full-scale experiments for developing a guidance to improve practical integration of operative temperature into the radiant panel control systems.
- Developing practical measures for effective sensor adjustments to improve the accuracy of operative temperature measurement. This includes analyzing the role of influential factors, such as (a) solar radiation (direct sunlight hitting the sensor); (b) sensor location (distance from occupants, local buoyancy sources, inconvenient sensor location); (c) proximity to air distribution systems; (d) size of sensor; (e) sensor color (absorptivity to longwave and shortwave radiation); (f) sensor shape (semispherical or flat sensors integrated into walls); (g) sensor dynamics (responsiveness), on the accuracy of operative temperature measurement.
- Advancing control algorithms for radiant panels with operative temperature control for achieving thermal comfort and energy saving in the radiantly conditioned spaces.

01.2017 – 01.2019
**Experimental Verification of Cooling Load Calculations for Spaces with Non-Uniform Temperature Radiant Surfaces**
Sponsored by The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE 1729-RP) (Total Value at ~ $180K, Awarded 07/2016, Completed)
(PI: Atila Novoselac) (**My Role: Lead Researcher**)

- Leading the effort to develop an experimental setup to investigate complex heat transfer of radiant cooling systems, to identify fundamentals of cooling load for these systems, and to determine how the cooling load for radiant systems differs from conventional all-air HVAC systems.
- Exploring limitations of commonly-applied load calculation methods, such as Heat balance method (HBM) and radiant time series (RTS) for radiant cooling systems.
- Major Contribution in software development, validation and extension of the HBM for cooling load calculation of radiant panel systems in the ASHRAE load calculation toolkit for worldwide use by HVAC practitioners.

- Development of new models for design procedures and guidance for system sizing for hydronic radiant cooling panels, and incorporate them in the ASHRAE handbook and other relevant building design guidelines used worldwide by HVAC practitioners.

### M.Sc. Research Assistant
Center for Energy Excellence (CEE),
K. N. Toosi University of Technology, Tehran, Iran

09.2013 – 12.2015
**Building System Design Parameter Estimation Using Inverse Analysis Technique**
Sponsored by Center for Energy Excellence (CEE) (**My Role: Lead Researcher**)

- Development of an energy modeling framework for building thermal parameter estimation using inverse analysis technique to optimize energy consumption, and improve thermal comfort for occupants.
- Extension of inverse energy modeling platform to incorporate optimal thermal system design for various HVAC systems (e.g., radiator, fan coil and solar water heater).

10.2012 – 09.2013
**Optimal Building Energy Simulation Using Stochastic Optimization Methods**

- Applying Genetic & PSO optimization algorithms coupled with the whole-building energy simulation software (EnergyPlus) to optimize energy consumption with HVAC systems in residential and commercial buildings for different climates in Iran.

### B.Sc. Research Assistant
Islamic Azad University, Tehran, Iran

08.2011 – 01.2012
**Numerical modeling of HVAC system design in Hospitals**
- HVAC system engineering design for hospitals using EnergyPlus and Carrier software.

## *TECHNICAL EXPRIENCE*

10.2020 – Present
**UT Austin Campus Energy Plant, Utilities and Energy Management**

- Technical data collection, analysis and processing for district energy (DE) and electrical grid systems at Carl J. Eckhardt Combined Heating and Power Complex at University of Texas at Austin as a real-world DE/microgrid testbed for validating models developed for smart grid-interactive energy systems for supporting DOE # 1980-1587.

10.2020 – 01.2021
**Technical Experience working with Novel Indoor Air Quality Measurement Techniques**

- Design and development of a comprehensive experimental setup for measuring microbial VOCs (mVOCs) emission from the HVAC ducts.

- Working with proton transfer reaction time-of-flight mass spectrometry (PTR-TOF-MS) for real-time detection of mVOC emission from various duct materials.

- Development of data acquisition and processing software (in LabView) for collecting and monitoring data with high resolution from the experimental measurements.

04.2019 – 07.2019
**Design and Development of a Test Facility for Evaluation of Ozone Removal Air Cleaning Devices**

- Assisting with design and development of a test rig (in response to ASHRAE 1579-RP) for testing/evaluating ozone removal efficiency from various filters (e.g., carbon filters, UVPCO devices, Catalyst filters) currently available in the market.

- Design and deployment of sophisticated control systems for: (1) controlling ozone concentration in the test rig, and (2) controlling humidification (using steamer) and relative humidity of ambient air in the air handling unit.

01.2019 – 01.2021
**UT Roof Testing Laboratory Construction and Development**

- Follow-up to SBIR Phase I effort (NSF-1648007) by PC Krause and Associates Inc. (PCKA) related to design, development and optimization of passive radiative composite (PRC) material, prototype fabrication, and testing of PRC technology.

- In collaboration with PCKA and in response to SBIR Phase II (NSF-1831805) for manufacturing PRC films, and commercial-scale deployment and testing of PRC-based roofing technology for building energy management.

- Design and development of twin test houses with interchangeable metal roof assemblies, and equipping them with numerous temperature and heat flux sensors for heat transfer analysis of PRC-based roof structure.

- Replacement and installation of metal roofing products (30-gauge galvanized steel corrugated panels, FABRAL heavy-gauge galvanized steel and bone white cool roofs) at the test houses.

- Installation and deployment of sophisticated measuring instrumentations, advance control systems, data acquisition systems, and diagnostic equipment for comparing thermal performance of the test houses with different roof assemblies.

01.2017 – 10.2018
**UT Thermal Façade Laboratory Development, Installation and Equipment**

- Follow-up to the prior IGERT: Sustainable Grid Integration of Distributed and Renewable Resources Project (NSF-0966298) for design and construction of Thermal Facade Laboratory (TFL).
- In collaboration with the UT school of Architecture and in response to ASHRAE 1729-RP for the purpose of extensive experimental measurements for developing cooling load calculation methods for radiant cooling systems.

- Design and installation of hydronic-based HVAC system, including facilities to support both all-air and radiant cooling systems (flat and Sanken panels).

- Design and implementation of different ventilation strategies, including mechanical ventilation by fan Coil and indoor air circulation by ceiling fans.

- Design and deployment of sophisticated automatic control systems for operation of radiant and air systems at the Thermal Façade Lab.

- Design and assembly of air/operative temperature sensors for thermal comfort analysis.

03.2008 – 11.2012
**Technical/Practical Work Experience in HVAC Industry, Iran.**

- Worked part-time as a student in the private sector for design, installation and restoration of various HVAC projects in residential (heating and cooling) and commercial buildings (Hospital, hotel, office buildings).

## *TEACHING EXPRIENCE*

01.2017 – 01.2022
**Graduate Student, Department of Civil, Architectural and Environmental Engineering, University of Texas at Austin, USA**

**Teaching Assistant** in graduate and senior-undergraduate level courses: *Energy Simulation in Building Design* (Fall 2017, Fall 2018, Fall 2019), *Building Environmental Systems* (Fall 2020), *Building Energy Management Systems* (Spring 2019), and *Introduction to Architectural Engineering* (Spring 2018). This included class discussion sessions, office hours, prepared and graded quizzes, assignments, and projects.

10.2014 – 01.2016
**Graduate Student, Department of Mechanical Engineering, K. N. Toosi University of Technology, Iran.**

**Teaching Assistant** for various undergraduate courses: Fluid Mechanics I (Fall 2014), Heat Transfer II (Spring 2015), Thermodynamics II (Fall 2015), and HVAC Design (Spring 2015). This included lectures, discussion sessions, office hours, graded class projects, and assistant for laboratory/experimental courses.

## *MENTORSHIP EXPRIENCE*

**University of Texas at Austin**
08.2019 – 03.2020 Justin Guinn (Currently pursuing PhD at UT Austin)
07.2018 – 12.2021 Mengjia Tang (Currently PhD student at UT Austin)
06.2021 – 11.2021 Michael Wade (Currently PhD student at UT Austin)
06.2021 – 12.2021 Ben Marshall (Currently pursing PhD at UT Austin)

**K. N. Toosi University of Technology, Iran**
05.2015 – 11.2015 Ali Javadi (Now senior engineer at Ministry of Energy Department, Iran)
10.2014 – 03.2015 Shohreh Tajik (Now research engineer, Sydney, Australia)

## *PROFESSIONAL EXPRIENCE*

- **Reviewer:** International Journal of Thermal Science; Journal of Heat Transfer-Transaction of ASME; Energy and Buildings; Journal of Solar Energy Engineering (ASME): including Wind Energy and Building Energy Conversion.

- **Chair and convener** for session “Application of Solar Heating Systems” at the 2nd Conference on Exhibition on Solar Energy, September 2015, University of Tehran, Tehran, Iran.

- **Co-chair and co-convener** for session “Energy efficient HVAC systems, operation and control” at the 6th International Conference on Heating, Ventilation, Air Conditioning (ICHVAC), Tehran, Iran, 2015.

## *ACADEMIC HONORS & AWARDS*

September 2020
**Grant-In-Aid (GIA) Honorarium**, ***The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)***
Merit-based Grant-In-Aid (GIA) honorarium for publishing GIA-related research in ASHRAE conference, (Total Value at $1.5K)

2017 - 2018
**Grant-In-Aid (GIA) Fellowship**, ***The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)***
Merit-based Grant-In-Aid (GIA) Fellowship to support ASHRAE-related research,
(Total Value at $10K)

September 2018
**Kolodzey Travel Grant, *Department of Civil, Architectural & Environmental engineering at University of Texas at Austin***
Merit-based award for graduate students for traveling to technical conferences,
(Total Value at ~ $1K).

August 2016
**Preeminent Distinguished Researcher, K. N. Toosi University of Technology, Iran**
Merit-based award for the best research M.Sc. student among all Engineering Departments.

2013 - 2015
**Government Fellowship for Graduate Studies, Iran**

2009
**Ranked 1st** among 20,000 participants in National BSc undergraduate Entrance Exam, Iran.

2007
**Ranked 2nd** among 10,000 participants in National ASc undergraduate Entrance Exam, Iran.

## *LIST OF PUBLICATIONS*

Google Scholar Page (Citations: 59; h-index: 4; as of 12/30/2021)

### PEER-REVIEWED JOURNAL PUBLICATIONS

- **Moftakhari, A.**, Novoselac, A. (2020). Improvement in the Operative Temperature Measurement of Radiant Cooling Panels, *ASHRAE Transactions*, Vol. 126 (2), pp. 419-426.

- **Moftakhari, A.**, Moftakhari Chaei Ghazvin, A. (2017). Natural Element Method Study of Combined Convective and Radiative Heat Transfer in Irregular shaped Mediums with Radiative Properties, *International Journal of Thermal Science*, Vol. 122, pp. 141-161, (DOI: 10.1016/j.ijthermalsci.2017.07.029).

- **Moftakhari, A.**, Aghanajafi, C., Moftakhari Chaei Ghazvin, A. (2017). A Novel Numerical Approach for Convective and Radiative Heat Transfer Analysis of Fluid Flow Problems Within Triangular Cavities Using Natural Element Method, *Journal of Heat Transfer- Transaction of ASME*, Vol. 139(8), 082002, (https://doi.org/10.1115/1.4036057).

- **Moftakhari, A.**, Aghanajafi, C., Moftakhari Chaei Ghazvin, A. (2017). Inverse heat transfer analysis of radiator central heating systems inside residential buildings using sensitivity analysis, *Inverse Problems in Science and Engineering*, Vol. 25, Issue 4, pp. 580-607, (DOI:10.1080/17415977.2016.1178258).

- **Moftakhari, A.**, Torabi, F., Aghanajafi, C. (2016). A novel energy simulation approach for thermal design of buildings equipped with radiative panels using inverse methodology, *Energy and Buildings*, Vol.113, pp.169-181 (DOI:10.1016/j.enbuild.2015.12.007).

- **Moftakhari, A.**, Aghanajafi, C., Moftakhari Chaei Ghazvin, A. (2016). An innovative inverse analysis technique for building cooling design with HVAC systems, *Science and Technology for the Built Environment*, Vol.22, Issue 3, pp. 299-316, (DOI:10.1080/23744731.2016.1132940).

- **Moftakhari, A.**, Aghanajafi, C. (2016). An inverse parameter estimation method for building thermal analysis, *Journal of Solar Energy Engineering (ASME): Including Wind Energy and Building Energy Conversion*, Vol. 138, Issue 2, pp. 021004-021004-11, (DOI: 10.1115/1.4032476).

- **Moftakhari, A.**, Aghanajafi, C., Moftakhari Chaei Ghazvin, A. (2016). Thermal analysis of HVAC and Solar panels using genetic optimization algorithm, *Journal of Mechanical Science and Technology*, Springer Verlag, Vol. 30, No. 3, pp. 1405-1412, (DOI: 10.1007/s12206-016-0248-9).

- **Moftakhari, A.**, Aghanajafi, C., Moftakhari Chaei Ghazvin, A. (2015). A Comparative study of HVAC and Radiant systems for heating buildings in different climates of Iran, *Indian Journal of Natural Science (IJONS)*, Vol. 31, pp. 8615-8633.

**PEER-REVIEWED CONFERENCE PROCEEDINGS**

- **Moftakhari, A.**, Novoselac, A. (2020). Experimental Study on Cooling Loads of Radiant and All-Air Systems, *ASHRAE Virtual Conference*.

- **Moftakhari, A.**, Aghanajafi, C., Moftakhari Chaei Ghazvin, A. (2015). The use of solar radiative panels for heating residential buildings in different climates of Iran, *The 2nd Conference on Exhibition on Solar Energy*, University of Tehran, Tehran, Iran.

- **Moftakhari, A.**, Aghanajafi, C. (2015). Inverse design of residential room with radiative panels", *The 7th Conference on efficient, clean and Renewable Energy*, Tehran, Iran (In Persian).

- **Moftakhari, A.**, Aghanajafi, C., Moftakhari chaei ghazvin, A. (2015). The use of solar energy to optimize energy consumption pattern in Iran, *The 3rd International symposium on Environmental & Water Resources Engineering*, K. N. Toosi University of Technology, Tehran, Iran.

- **Moftakhari, A.**, Aghanajafi, C. (2015). Building energy consumption using generic algorithm, *the 1st Conference on Heating, Ventilation, Air Conditioning (HVAC) and Heating & Cooling Installation*, Tehran, Iran (In Persian).

- **Moftakhari, A.**, Aghanajafi, C. (2015). Inverse Design of conductivity coefficient in building equipped with solar panels, *The 6th International Conference on Heating, Ventilation, Air Conditioning (ICHVAC)*, Tehran, Iran (In Persian).

- **Moftakhari, A.**, Aghanajafi, C. (2015). Thermal Analysis of a residential room equipped with Solar panel using generic algorithm, *The 6th International Conference on Heating, Ventilation, Air Conditioning (ICHVAC),* Tehran, Iran.

- **Moftakhari, A.**, Moftakhari chaei ghazvin, A. (2015). Estimation of Building energy consumption using PSO optimization algorithm, *The 7th Conference on efficient, clean and Renewable Energy*, Tehran, Iran.

**PAPERS IN PREPARATION / UNDER REVIEW**

- **Moftakhari, A.**, Bourne, S., Novoselac, A. Cooling Load Comparison of Rooms Conditioned with Radiant Cooling Panels and All-Air HVAC Systems, *Science and Technology for the Built Environment*.

- **Moftakhari, A.**, Novoselac, A. Parametric Analysis of Cooling Load for Radiant Cooling Systems, *Building and Environment*.

- **Moftakhari, A.**, Novoselac, A. New Convection Correlations for Ceiling Fans in Rooms with Radiant and Air systems, *Energy and Buildings*.

- **Moftakhari, A.**, Novoselac, A. New model for cooling load calculation of light radiant cooling panels, *Applied Energy*.

- **Moftakhari, A.**, Ippei, I., Novoselac, A. On Enhancing Cooling Capacity of Radiant Cooling Systems, *Building and Environment*.

- **Moftakhari, A.**, Novoselac, A. Fundamentals of Cooling Load Calculation for Radiant Systems, *Energy*.

- Barnaby, C.**, Moftakhari, A.**, Novoselac, A. Modification of Heat Balance Method for Cooling Load Calculation of Radiant Systems in ASHRAE Load Calculation Toolkit, *Journal of Building Performance Simulation*.

- Du, J., **Moftakhari, A.**, Novoselac, A. Heat Transfer Dynamics of Rooms with Radiant Floor and Ceiling Cooling Systems, *Building Simulation*.

- **Moftakhari, A.**, Novoselac, A., Heltzel, A., Full-scale measurement of passive radiant cooling roofing materials for cooling buildings, *Solar Energy*.

- **Moftakhari, A.**, Misztal, P., Novoselac, A., Kinney, K., Microbial VOC analysis for mold growth from air conditioning ductwork, *Indoor Air*.

## *TECHNICAL REPORTS*

- Heltzel, A.**, Moftakhari, A.**, Novoselac, A. (2021), SBIR Phase II: Passive Radiative Composite Material: National Science Foundation Project No. 1831805. PC Krause and Associates, Inc. (PCKA).

- **Moftakhari, A.**, Bourne, S., Novoselac, A. (2020), Experiment Verification of Cooling Load Calculations for Spaces with Non-Uniform Temperature Radiant Surface: ASHRAE 1729-TRP Project (No. 1729- TRP). Austin, TX: University of Texas at Austin.

## *SEMINARS, INVITED TALKS & CONFERENCE PRESENTATIONS*

- **Moftakhari, A.**, Novoselac, A., **Paper Session 17**: Experimental Study of Radiant Systems, District Cooling Plants: "Experimental Study on Cooling Loads of Radiant and All-Air Systems", *ASHRAE Annual Virtual Conference*, May 2020.
- **Moftakhari, A., Seminar 06** — Updates and Lessons Learned from Recent Room Load Calculation Research: "Role of Surface Boundary Condition on the Room Convective and Radiative Loads", *ASHRAE Winter conference*, Orlando, FL, January 2020.
- **Moftakhari, A., Seminar 26** - Load Calculation Considerations for Radiant Systems: "Difference in Cooling Loads for Radiant and All-Air Systems for Different Load Scenarios", *ASHRAE Winter conference*, Atlanta, Georgia, January 2019.
- **Presenting On behalf of Novoselac, A., Seminar 26** - Load Calculation Considerations for Radiant Systems: "What Happens when Radiant Systems are Designed by Methods Developed for All-air Systems?", *ASHRAE Winter conference*, Atlanta, Georgia, January 2019.
- **Moftakhari, A., Seminar 61***: Convective Vs. Radiant Load Calculations: Are They Different?* " Difference in Cooling Loads for Radiant and All-Air Systems for Different Types of Heat Gains and Control (Operative vs. Air) Temperature", *ASHRAE Annual conference*, Houston, TX, June 2018.

## *SOFTWARE DEVELOPMENT*

- Development, validation and extension of heat balance method (HBM) for cooling load calculation of radiant cooling systems, currently incorporated in the ASHRAE load calculation toolkit for worldwide use by HVAC practitioners.

## *PROFESSIONAL MEMBERSHIP*

- The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
- Corresponding Member of ASHRAE Technical Committees (TC): TC 4.1 (Load Calculation Procedure), TC 6.5 (Radiant heating and cooling systems), TC 7.5 (Smart building systems), TC5.3 (Room Air Distribution), TC 2.3 (Gaseous Air Contaminants and Gas Contaminant Removal Equipment), TC 2.4 (Particulate Air Contaminants and Particulate Contaminant Removal Equipment), TC 4.10 (Indoor Environmental Modeling)
- UT Austin Engineering Graduate Student Association

## *SOFTWARE SKILLS*

| | |
|---|---|
| *Operating systems* | Microsoft Windows, Linux |
| *Programming* | MATLAB, C++, Python, Java, FORTRAN77/FORTRAN90 |
| *Mechanical Engineering* | ANSYS, FLUENT, CFX, OpenFOAM, STAR-CCM+, Solid Works |
| *Architectural Engineering* | Autodesk Revit, Autodesk Ecotect, Auto CAD, Sketch up |
| *Building Energy Simulation* | Modelica, EnergyPlus, OpenStudio, BEOPT, eQUEST, Carrier |
| *Control & Mesaurements* | LabView, National Instruments |
| *Word processor* | LATEX, Microsoft Office, Open Office |

## LANGUAGES

*English, German, Persian*

## REFERENCES


Prof. Atila Novoselac

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