AHMET UGURSAL, PhD, CEM

Energy Systems Laboratory, Texas A&M University
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PROFESSIONAL PROFILE

Significant experience in building Heating, Ventilation and Air-conditioning optimization at the Energy Management and Control System level and major field experience in Continuous Commissioning® (CC®) of building systems for energy reduction purposes.

Proficiency in building energy modeling using various simulation tools and energy use analysis based on trended field data.

Wide range of teaching experience in technical workshops as well as various design and technical courses including fourth year design studio, energy and computational fluid dynamics simulations for sustainable building design, and environmental control systems.

Extensive know-how in experimental research design, data collection, and analysis, including psychophysiological human subject tests, field data collection, and test cell research for passive solar systems.

EDUCATION

Ph.D., Architecture, Texas A&M University (TAMU), College Station, TX, 2010.

DISSERTATION: Thermal Comfort under Transient Metabolic and Dynamic Localized Airflow Conditions Combined with Neutral and Warm Ambient Temperatures.

M.Arch., Architecture, Ball State University (BSU), Muncie, IN, 2005.

THESIS: The Effects of Human Behavior and Information-transmitting Medium on the Library Building Typology.

M.S., Building Science, Middle East Technical University (METU), Ankara, 2003.

THESIS: Integration of Natural Ventilation to Office Building Typology in the Ankara Context

B.Arch., Architecture, Middle East Technical University, Ankara, 2000.

ACADEMIC/PROFESSIONAL INTERESTS

Sustainable Building Technologies, Energy Management Systems, HVAC Systems Design, Passive Heating and Cooling Systems, Building Energy Simulation and Conservation.

Thermal Comfort in Office Spaces, Human Thermal Modeling, Airflow and Comfort Relation, Transient and Non-uniform Environmental Conditions in Office Spaces.

WORK EXPERIENCE

Senior Research Engineer, Energy Systems Lab, TAMU, Apr '21 - Present.

Co-Principal Investigator and Project Manager, "Energy Management, Sustainability and Measurement and Verification (M&V) Services for Houston Airport System", 2018-Current, Houston, TX, $1.143M.

Defined the scope of the project with related activities, staffing and deliverables. Managed a team of engineers and analysts to accomplish the project goals.

Supported HAS's net-zero initiative through overall energy management of the HVAC system.

Routinely verified the HVAC equipment to identify and mitigate operational and mechanical deficiencies.

Managed trends and databases that enabled automated backups and transfer of data.

Conducted periodic efficiency analysis of chillers, boilers and the related equipment.

Monitored key operational parameters such as chilled-water or hot water supply/return temperatures as well as system differential pressures.

Provided technical assistance to the maintenance contractor in identifying inefficiencies, deficiencies, and energy savings opportunities.

Provided operational and controls recommendations to reduce energy consumption of the equipment.

Managed the analysis of electricity and natural gas utility bills for more than 100 HAS accounts for M&V purposes.

Co-Principal Investigator, Project Manager & Engineering Team Leader, "Capital Improvement and Energy Efficiency Upgrade Project at the William P. Hobby Airport and the George Bush Intercontinental Airport", 2019-Current, Houston, TX, $28.4M.

Managed a team engineers to accomplish project goals.

Provided technical support for decision making purposes at various levels including systems design and component selection.

Conducted energy analysis for various systems including lighting, HVAC and baggage handling systems.

Implemented Continuous Commissioning® at Terminal A that includes verification of sensors and components, programming of HVAC equipment and optimization of energy use.

Acted as technical liaison between the subcontractor engineering teams, the HAS maintenance contractors and HAS administration.

WORK EXPERIENCE (Cont'd)

Assistant Research Engineer, Energy Systems Lab, TAMU, Sep '17 to Apr '21.

Co-PI and Project Lead Engineer, "Energy Services, Research and Development of Technical Initiatives and Work Force Development", master agreement, 2019-Current, $284K in LOAs to-date.

Technical Director, "IAH Central Utility Plant Capacity Analysis and Condition Assessment", 2019-Current, Houston, TX, $220K.

Provided technical support to various engineering teams during and after the analysis and assessment.

Reviewed and verified the data and reports provided by various engineering teams.

Project Manager & Lead Engineer, "Energy Management and Technical Support Services for the Toronto Pearson International Airport", 2017-2019, Toronto, Canada, $62K.

Analyzed the central utility plant (CUP) sequence of operations.

Conducted trend data analysis of various sub-systems at CUP including chilled-water and condenser water systems.

Identified and quantified the energy savings opportunities based on the optimization of chiller, cooling tower, and pump staging, as well as optimization of key operational parameters such as chilled and condenser water supply temperatures and system pressures.

Engineering Research Associate III, Energy Systems Lab, TAMU, Jan '11 to Aug '17.

Project Engineer, "Various Continuous Commissioning, Energy Efficiency and Analysis Projects", 2011-2017.

Developed and programmed energy efficiency measures for Alamo Community College Distric and Dallas/Fort Worth International Airport facilities using Schneider Electric I/Net and Andover Infinity and Continuum systems.

Analyzed thermal comfort conditions and energy use of over 70 buildings in Alamo Community College District campuses and in Dallas/Fort Worth (DFW) International Airport and implemented CC® measures to improve the thermal comfort of the occupants and reduce the energy use of the buildings.

Conducted hydraulic system simulations and optimized energy use of central plant chilled water and hot water distribution systems. Conducted performance analysis of chillers and boilers for energy optimization and capital improvement projects.

Supervised other Energy Systems Lab (ESL) engineers on the concepts and practical applications of energy conservation and optimization including HVAC equipment and building thermal balance. Trained graduate students on CC® processes who were later hired as full time engineers by the industry.

Conducted whole building energy simulations and analyzed the performance of fenestration systems using state-of-the-art simulation tools.

WORK EXPERIENCE (Cont'd)

Research/Teaching Assistant, Energy Systems Lab/Architecture, Aug '05 to Dec '10.

Conducted dissertation research on human thermal modeling and thermal comfort under transient and non-uniform conditions.

Built and analyzed interior space air-flow simulations for improved occupancy thermal comfort; and built energy simulations for low-energy residential and commercial buildings.

Researched turbulence models in Computational Fluid Dynamics (CFD) simulations and conducted CFD simulations of flexible and rigid ducts under various airflow conditions.

Taught for various classes as Visiting Lecturer including ARCH 334, ARCH 421, ARCH 435, ARCH 643 and ARCH 689.

Research Associate, Natural Energies Advanced Tech. Lab, UNLV, Aug '04 to July '05.

Designed, supervised and managed the research of passive solar test cells for Skytherm Southwest Roof-pond systems. Provided technical support for the development of RP_Performance roof-pond design tool. Researched on thermal behavior of water as a wall infill material.

Taught for various classes as Visiting Lecturer including ABS 331/332 Environmental Control Systems I-II classes.

Graduate Assistant, Center for Energy Research, BSU, Aug '02 to May '04.

Researched the life-cycle cost of solar test cells for different passive solar heating strategies including Roof Pond, Direct Gain, Trombe-wall, Water-wall.

Research/Teaching Assistant, METU, Jan '02 to Aug '04.

Worked as Teaching Assistant for Arch 351/352 Architectural Detailing classes.

Designed the Kerkenes Eco-center project and the mountain rescue center for climbers in Nigde, Turkey and researched low-tech sustainable technologies as part of the Eco-center.

Organized CIB W62 2003 Conference as part of the organization team.

Architect/Designer, Orsel Inc., July '00 to Jan '02.

Designed as part of a team various architectural projects including Biala Podlaska International Airport (4,688,000 ft^2) and Chestochowa International Airport (1,150,000 ft^2) in Poland, political party HQ (279,000 ft^2) in Turkey, Uchkuduk Airport (215,000 ft^2) in Uzbekistan, a four-star hotel (130,000 ft^2) and a high school building (75,000 ft^2) in Turkey.

PRESENTATIONS

Ugursal, A, & J. T. Martinez, C. Yagua (2018). Continuous Commissioning® Workshop. Texas Energy Summit. September 2018, Houston, TX.

Ugursal, A, & J. T. Martinez, C. Yagua (2017). Continuous Commissioning® Workshop. Texas Energy Summit. November 2017, Plano, TX.

Ugursal, A (2017). Continuous Commissioning®. Texas Energy Managers Association (TEMA) Expo. April 2017, League City, TX.

Ugursal, A. (2016). Continuous Commissioning® Concepts and Applications. North Texas Association of Energy Engineers (NTAEE) Conference. Oct 2016, Fort Worth, TX.

Ugursal, A. (2014). Airflow Perception and Draught Rating for Varying Thermal Conditions. ASHRAE 2014 Annual Conference, July 2014, Seattle, WA.

Ugursal, A. (2013). Gender Differences of Thermal Comfort Perception under Transient Environmental and Metabolic Conditions. ASHRAE 2013 Annual Conference, June 2013, Denver, CO.

Ugursal, A. (2013). The Development of a Test Methodology for Transient Thermal Comfort Analysis. ASHRAE 2013 Annual Conference, June 2013, Denver, CO.

Ugursal, A & J. T. Martinez, K. Meline (2012). Great Utility Savings Opportunities in Existing Buildings Using Continuous Commissioning®. NTAEE Conference. Oct 2012, Dallas, TX.

Ugursal, A. (2012). An Empirical Thermal Comfort Model for Transient Metabolic Conditions. ASHRAE Winter Meeting, Jan 2012, Chicago, IL.

Ugursal, A. (2008). Time-dependent Thermal Comfort. Poster Presentation, American Institute of Architects (AIA) Convention, May 2008, Boston, MA.

Ugursal, A. and C. H. Culp**.** (2008). ASHRAE Research Project 1333. ASHRAE Austin Chapter Meeting, May 2008, Austin, TX.

Ugursal, A. and C. H. Culp (2007). Comparative Analysis of CFD DP vs. Measured DP for Compressed Flexible Ducts. ASHRAE Winter Meeting, Jan 2007, Dallas, TX.

Ugursal, A. (2007). CFD Calculations and Measured DP Data: 8" Flexible Duct. ASHRAE Annual Meeting, June 2007, Long Beach, CA.

RESEARCH REPORTS

Ugursal, A. *et al*. (2015). *Methodology to Develop the Airport Terminal Building Energy Use Intensity (ATB-EUI) Benchmarking Tool*. TRB Research Report: ACRP 09-10. Available online: http://www.trb.org/Main/Blurbs/174291.aspx.

Ugursal, A, *et al.* (2014). Dallas/Fort Worth International Airport Central Utility Plant Boiler Analysis Final Report.

Ugursal, A. *et al*. (2013). *Analysis of the Potential Applications of Solar Thermal and Photovoltaic Systems*. Energy Systems Laboratory Research Report: ESL-TR-13-06-01. Available online: http://oaktrust.library.tamu.edu/.

Ugursal, A, *et al.* (2011). Dallas/Fort Worth International Airport Central Utility Plant Hydraulic Analysis Final Report.

PUBLICATIONS

Ugursal, A. & L. Tassinary, C. H. Culp (2014). *Airflow Perception and Draught Rating for Varying Thermal Conditions*. Conference Proceedings of the ASHRAE 2014 Annual Conference, June 28-July 2, 2014, Seattle, WA.

Ugursal, A. & C. H. Culp (2013). *The Effect of Temperature, Metabolic Rate and Dynamic Localized Airflow on Thermal Comfort*. Applied Energy 111: 64-73.

Ugursal, A. & C. H. Culp (2013). *Gender Differences of Thermal Comfort Perception under Transient Environmental and Metabolic Conditions*. ASHRAE Transactions 119(2): 52-62.

Ugursal, A. & C. H. Culp (2013). *The Development of a Test Methodology for Transient Thermal Comfort Analysis*. Conference Proceedings of the ASHRAE 2013 Annual Conference, June 22-26, 2013, Denver, CO.

Ugursal, A. & C. H. Culp (2012). *An Empirical Thermal Comfort Model for Transient Metabolic Conditions*. ASHRAE Transactions 118(1): 742-750.

Ugursal, A. & C. H. Culp (2008). *The Effects of Geometry on the Flexible Duct CFD Simulations.* 16th Symposium on Improving Building Systems in Hot and Humid Climates, Dec. 15-17, Dallas, TX.

Ugursal, A. and C. H. Culp (2007). *Comparative Analysis of CFD DP vs. Measured DP for Compressed Flexible Ducts*. ASHRAE Transactions 113(1): 462-469.

Ugursal, A. & C. H. Culp (2006). *Comparative Study: CFD* D*P versus Measured DP for 30% Flexible Ducts*. 15th Symposium on Improving Building Systems in Hot and Humid Climates, July 22-26, Orlando, FL.

Fernandez-Gonzalez, A. & **A. Ugursal** (2005). *Economic Analysis of the Cost Effectiveness of Passive Solar Heating Strategies in the Midwest of the United States*. Proceedings of the 2005 Solar World Congress. / 34th American Solar Energy Society National Conference, August 6-12, Orlando, FL, Campbell-Howe, R. (Ed): p.1549, six pages, American Solar Energy Society, Boulder.

GRANTS AND AWARDS

ARCC King Student Medal for Excellence in Architectural + Environmental Research, 2011.

Graduate Scholarship, ASHRAE Houston Chapter, 2008, 2009.

Grant-in-Aid, ASHRAE, 2008.

Architectural Research Grant, Boston Society of Architects, 2006.

Research Assistantships and Tuition Waivers, METU, BSU, TAMU, 2002 – 2010.

SERVICES

Undergraduate Student Mentor, Regent Scholar Mentor Program (2009-10).

University Architect Search Committee Member (2009).

ASHRAE TAMU Chapter President (2007-08), Treasurer (2006-07), Secretary (2009-10).

Turkish Student Association Vice President (2006-07).

COMPUTER SKILLS

Simulation, EQuest and EcoTect Building Energy Simulation Tools, Gambit & Fluent, and Star-CCM+ CFD Simulation Programs.

Energy Management and Control Systems, JC Metasys, Andover Infinity and Continuum Systems, and TAC I/Net.

MEMBERSHIPS

AEE (Association of Energy Engineers), Certified Energy Manager.

USGBC (United States Green Building Council), Member.

TMMOB (Chamber of Architects, Section of UIA in Turkey), Registered Architect.

LANGUAGES

Turkish (native), English (fluent), Russian (beginner).

REFERENCES

Joseph T. Martinez, Associate Director, ESL, TAMU.	Ph: 1 (979) 845-3866
Charles Culp, Professor of Arch, TAMU.	Ph: 1 (979) 458-3600
David Claridge. Prof. of Mech Eng. & ESL Director, TAMU.	Ph: 1 (979) 845-9213