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Engineering & Scientific Consulting

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Professional Profile

Dr. Jokar specializes in thermodynamics, fluid mechanics, heat transfer, and heating, ventilation, air-conditioning and refrigeration (HVAC&R) systems. He has more than 16 years of work experience both in industry and academia.

At Exponent, he has worked on projects with applications related to air conditioning and refrigeration systems, flammable refrigerants, refrigerators and vending machines, supermarket coolers and freezers, ammonia systems, heat transfer equipment, valve design, natural gas and solar power generation plants, boilers, furnaces, kitchen ovens, household washers and dryers, hot water heaters, pipes freeze and burst, and insulation materials. He has also collaborated on multi-disciplinary projects, such as comprehensive study of wildfire smoke and ash-soot-char distribution and contamination, residential and industrial fires, vehicle thermal failures, carbon monoxide poisoning, mold/odor issues in automotive and residential cooling systems, heat transfer in burn injuries, health risk assessments, data centers, and oil refineries design and contamination issues. His work experience includes experimentation as well as simulation using computational thermal/fluid dynamics (CFD) techniques. He has testifying experience with several cases in the State of California.

In academia, he conducted research on industry-sponsored research projects and obtained competitive grants as the principal investigator including: experimental study of carbon dioxide condensation in a chevron-angle plate geometry exchanger (sponsored by ASHRAE), and computational analysis and experimental design of a microchannel electronics cooler for high-power semiconductor diode laser applications (sponsored by Washington Technology Center). He also conducted comprehensive research during his doctoral study to evaluate and analyze a dual-loop automotive heat pump-air conditioning system. He was the recipient of the ASHRAE New Investigator Award to study heat transfer and fluid flow of nanofluids in micro/mini-channel heat exchangers. He developed several courses and labs on thermo/fluids, including advanced courses on thermal systems and electronics cooling.

Academic Credentials & Professional Honors

Ph.D., Mechanical Engineering, Kansas State University, 2004

M.S., Mechanical Engineering, Amirkabir University of Technology, Iran, 1998

B.S., Mechanical Engineering, Sharif University of Technology, Iran, 1995

Distinguished Service Award (DSA), American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE), 2017

New Investigator Award, American Society of Heating, Refrigerating and Air-Conditioning Engineers

(ASHRAE), 2009

Instructor Award, Mechanical Engineering, Kansas State University, 2004

Licenses and Certifications

Licensed Professional Mechanical Engineer, California, #M35422

Certified Fire & Explosion Investigator (CFEI) in accordance with the National Association of Fire Investigators (NAFI) National Certification Board

OSHA 40-hour Hazardous Waste Operations & Emergency Response Standards (HAZWOPER)

Fire Investigation 1A (Cause and Origin), California Office of State Fire Marshal

Professional Affiliations

American Society of Heating, Refrigerating and Air Conditioning Engineers — ASHRAE Committee member:

- Technical Activities Committee- TAC (section 1 head, 2015-2019)
- TC 1.3; Heat Transfer and Fluid Flow (chair 2013-2015, vice chair 2013-2015, vice chair 2011-2013, program subcommittee chair 2008-2011, voting/corresponding member since 2011)
- TC 8.5; Liquid to Refrigerant Heat Exchangers (chair 2008-2010, program subcommittee chair 2005-2008, voting/corresponding member since 2011)
- TC 8.4; Air-to-Refrigerant Heat Transfer Equipment (corresponding member since 2011)
- TC 5.6; Control of Fire and Smoke (corresponding member since 2011)
- TG1; Optimization (corresponding member since 2009)
- TC 3.1; Refrigerants and Secondary Coolants (corresponding member since 2014)
- SSPC 188 (Standard); Legionellosis: Risk Management for Building Water Systems (since 2020)
- Local Chapter, Orange Empire, CA (since 2012)

American Society of Mechanical Engineers — ASME Committee member:

- Associate Editor; Journal of Thermal Science and Engineering Applications (2015-2019)
- HTD K10; Heat Transfer Equipment (since 2007)
- HTD K16; Heat Transfer in Electronic Equipment (since 2008)
- Local Chapter, Orange County, CA (since 2012)

National Fire Protection Association - NFPA

- NFPA 87; Standard for Fluid Heaters (member since 2012)

American Society of Automotive Engineers - SAE

Associate Editor; Heat Transfer Engineering, an International Journal (2020-present)

Languages

Persian

Publications

Jokar A, O'Hern S, Anderson D, Cundy M, Ogle R. Flammable Refrigerants: performance comparison, safeties and lessons learned. Proceedings, ASHRAE Winter Conference, art no. AT-2019-C063, Atlanta, GA, 2019.

Jokar A, Wade RL, Posson M, Bennett P. Impact of wildfire particulate on common building materials. Proceedings, 2nd International Smoke Symposium; art. no. 3807, Long Beach, CA, 2016.

Jokar A, Christiansen EW, Reza A. Refrigeration systems failures due to sudden evaporation and condensation phenomena. Proceedings, ASHRAE Annual Conference, art. no. SE-14-C015, Seattle, WA, 2014.

Wade RL, Jokar A, Cydzik K, Dershowitz A, Bronstein R. Wildland fire ash and particulate distribution in adjacent residential areas. International Journal of Wildland Fire 2013; 22 (8):1078-1082.

Jokar A, O'Halloran SP. Heat transfer and fluid flow analysis of nanofluids in corrugated plate heat exchangers using computational fluid dynamics simulation. Journal of Thermal Science and Engineering Applications 2013; 5 (1), art. no. 011002.

Ayub Z, Khan MS, Jokar A, Khan TS, Hayes N. Recent developments in plate exchangers - Ammonia/Carbon Dioxide cascade condensers. Heat Transfer Engineering 2013; 34 (5-6): 401-408.

Jokar A, Christiansen EW. Condensation induced shock in thermal/fluid systems. ASME Heat Transfer/Fluids Engineering Summer Conference; HT2012, art. no. 58117, Puerto Rico, USA, 2012.

Jokar A, Wade RL, Tu WJ. Effects of wildfire ash on thermal performance of attic insulation batts. Proceedings, ASME Heat Transfer/Fluids Engineering Summer Conference; HT2012: art. no. 58118, Puerto Rico, USA, 2012.

Hayes N, Jokar A, Ayub Z. Study of carbon dioxide condensation in Chevron plate exchangers; Pressure drop analysis. International Journal of Heat and Mass Transfer 2012; 55:2916-2925.

Hayes N, Jokar A, Ayub Z. Study of carbon dioxide condensation in Chevron plate exchangers: Heat transfer analysis. International Journal of Heat and Mass Transfer 2011; 54:1121-1131.

O'Halloran S, Jokar A. CFD simulation of single-phase flow in plate heat exchangers. ASHRAE Transactions 2011; 117 (Part 1): 147-155.

Jokar A. Thermal/fluid systems design with an innovative teaching method. International Journal of Mechanical Engineering Education 2011; 39(4):275-290.

Dix J, Jokar A. Fluid and thermal analysis of a microchannel electronics cooler using computational fluid dynamics. Applied Thermal Engineering 2010; 30(8-9):948-961.

Jokar A, Eckels SJ, Hosni MH. Single phase flow in mesochannel compact heat exchangers for air conditioning applications. Heat Transfer Engineering 2010; 31(1):3-16.

Jokar A, Solovitz S. Thermo/fluids curriculum development in a new mechanical engineering program. Proceedings, ASME International Mechanical Engineering Congress; IMECE2010, art. no. 37001(6): 155-162, Vancouver, BC, Canada 2010.

Jokar A, Hayes N, Ayub Z. Recent developments in CO2 cascade condensers. Proceedings, Sustainable Refrigeration and Heat Pump Technology Conference (International Institute of Refrigeration), Stockholm, Sweden, 2010.

Solovitz S, Jokar A. Micro-particle image velocimetry visualization of water flow in a complex micro-heat exchanger. *Journal of Flow Visualization and Image Processing* 2009; 16(3):221-236.

Hayes N, Jokar A. Dynalene/water correlations to be used for condensation of CO₂ in Brazed Plate Heat Exchangers. *ASHRAE Transactions* 2009; 115(2):599-616.

Cortez M, Jokar A. Development and testing of a prototype heat sink within a wind tunnel for use in an engineering course. *Proceedings, ASME International Mechanical Engineering Congress; IMECE2009*, art. no. 12084 (9-Part B): 983-989, Lake Buena Vista, FL, 2009.

Saffaraval F, Jokar A. Development of an R245fa electronics cooling system for high heat flux applications. *Proceedings, ASME International Mechanical Engineering Congress; IMECE2009*, art. no. 12076 (9-Part C): 1741-1747, Lake Buena Vista, FL, 2009.

Suffield S, Jokar A. Modeling the flow of a liquid droplet diffusing into various porous media for inkjet printing applications. *Proceedings, ASME International Mechanical Engineering Congress; IMECE2008*, art. no. 68151 (10-Part B): 1013-1022, Boston, MA, 2008.

Dix J, Jokar A, Martinsen R. Enhanced microchannel cooling for high-power semiconductor diode lasers. *Proceedings, SPIE Photonics West Conference; LASE2008-6876*: art. no. 687606, San Jose, CA, 2008.

Dix J, Jokar A, Martinsen R. A microchannel heat exchanger for electronics cooling applications. *Proceedings, 6th International Conference on Nanochannels, Microchannels, and Minichannels; ICNMM2008 (Part B):1935-1936*, Darmstadt, Germany, 2008.

Jokar A, Hosni MH, Eckels SJ. Mesochannel compact heat exchangers for automotive air conditioning applications. *Proceedings, 6th International Conference on Nanochannels, Microchannels, and Minichannels; ICNMM2008 (Part B): 1937-1938*, Darmstadt, Germany, 2008.

Jokar A. A hands-on approach to teaching thermal systems design. *Proceedings, ASME International Mechanical Engineering Congress; IMECE2007*, art. no. 41540 (7): 163-171, Seattle, WA, 2007.

Dix J, Jokar A, Martinsen R. Computational modeling for a microchannel electronics cooler. *Proceedings, ASME International Mechanical Engineering Congress; IMECE2007*, art. no. 42971 (5): 87-94, Seattle, WA, 2007.

Jokar A, Hosni MH, Eckels SJ. Dimensional analysis for the evaporation and condensation of refrigerant R134a in minichannel plate heat exchangers. *Applied Thermal Engineering* 2006; 26: 2287-2300.

Jokar A. Integration of computational fluid dynamics and experimentation in undergraduate fluid mechanics. *Proceedings, ASME International Mechanical Engineering Congress; IMECE2006*, art. no. 15256 (Mechanical Engineering Education), Chicago, IL, 2006.

Jokar A, Eckels SJ, Hosni MH. New generation integrated automotive thermal system. *SAE Future Transportation Technology Conference; FTT*, art. no. 01-3476, Chicago, IL, 2005.

Jokar A, Hosni MH, Eckels SJ. Correlations for heat transfer and pressure drop of glycol-water and air flows in minichannel heat exchangers. *ASHRAE Transactions* 2005; 111(2):213-224.

Jokar A, Hosni MH, Eckels SJ. Thermal-fluid characteristics of an automotive radiator used as the external heat exchanger in an auto air conditioning system. *Proceedings, ASME Heat Transfer Summer Conference; HT2005*, art. no. 72061 (4): 315-323, San Francisco, CA, 2005.

Jokar A, Hosni MH, Eckels SJ. A heat pump for automotive applications. *8th International Energy Agency*

Heat Pump Conference, Session: 7, Las Vegas, NV, 2005. (Published in IEA-HP newsletter 2005; 22).

Jokar A, Eckels SJ, Hosni MH, Giolda TP. Condensation heat transfer and pressure drop of the brazed plate heat exchangers using R134a. Journal of Enhanced Heat Transfer 2004; 11(2):161-182.

Jokar A, Eckels SJ, Hosni MH. Thermo-hydrodynamic of the evaporation of refrigerant R134a in brazed plate heat exchangers. Proceedings, ASME Heat Transfer/Fluids Engineering Summer Conference; HT-FED04, art. no. 56573(3):211-220, Charlotte, NC, 2004.

Jokar A, Eckels SJ, Hosni MH. Evaluation of heat transfer and pressure drop for the heater-core in an automotive heat pump system. Proceedings, ASME International Mechanical Engineering Congress; IMECE2004, art. no. 60824 (375-2):57-65, Anaheim, CA, 2004.

Peer Reviewer

National Science Foundation Panelist, Thermal Transport Processes

Journal of Thermal Science and Engineering Applications

Applied Thermal Engineering

Journal of Heat Transfer

Heat Transfer Engineering

Heat Transfer Research

Experimental Thermal and Fluid Science

Journal of Enhanced Heat Transfer

Journal of Electronic Packaging

International Journal of Refrigeration

Chemical Papers, International Journal

International Journal of Energy

Energy Conversion and Management

Special Topics & Reviews in Porous Media, An International Journal

Conferences: ASHRAE, ASME, ASEE, ITherm, InterPACK, HEFAT