

Farhad Fathieh

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Department of Chemistry.
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HIGHLIGHTS

- 7+ years of research experience in heat and moisture transfer in desiccant coated energy recovery systems (University of Saskatchewan, Saskatoon, CA) and combustion fundamentals (Sharif University of Technology, Tehran, Iran)
- Hands-on experience of developing laboratory facilities with precise A/D data acquisition and uncertainty analysis (Awarded Saskatchewan Innovation Scholarship 2014, University of Saskatchewan)
- Extensive knowledge in heat transfer, mass transfer, and fluid mechanics combined with good insight in surface chemistry and material science (Awarded Interdisciplinary Research Excellence 2016, University of Saskatchewan)
- Solid knowledge of mathematical analysis and modelling, analytical models developed to study heat/mass transfer and laminar diffusion combustion
- Strong communication skills, honed through teaching, numerous presentations at international conferences and seminars
- Highly critical thinker with effective researching skills proven through work experience in academic researches (Ph.D. and M.Sc. projects) and industrial projects
- Experienced in writing proposals and grant application for several grant agencies and highly involved in industrial collaborative projects
- Considerable experience in teaching and highly motivated for knowledge transfer with certifications on effective teaching, admired instructor by undergraduate students
- Highly motivated in teamwork and training new graduate students, able to coordinate research projects following the timelines and objectives

EDUCATION

2012-2016

Ph.D. Student, Department of Mechanical Engineering, University of Saskatchewan, Saskatoon, Canada

Supervisor: Prof. C. J. Simonson, Prof. R. W. Evitts, Prof. R. W. Besant

Thesis: A Transient Method for Testing Heat/Energy Wheel Components (Desiccant and Substrate)

2007-2009

Master of Applied Science, Sharif University of Technology, Tehran, Iran
Aerospace Engineering, Propulsion

Supervisor: Prof. M. Farshchi, Prof. A. Ghafourian

Thesis: Experimental and Analytical Study of a Laminar Diffusion Flame Response to Flow Field

2002-2007

Bachelor of Science, Sharif University of Technology, Tehran, Iran
Aerospace Engineering

EXPERIENCE

2012-present

Research Assistant

Thermal Science and Energy Laboratory

Dept. of Mechanical Engineering, University of Saskatchewan, Saskatoon, CA

- Developing test facilities to measure transient heat and moisture transfer occurring in lab-scale energy recovery and industrial samples
- Investigating heat and moisture transfer in Nano-pores of micron-size solid desiccant (silica gel and starch based bio-desiccant)
- Studying the interactions between the water vapour and solid surface functional groups during the sorption process
- Obtaining the sorptive, physical, and chemical properties of desiccant particles through several characterization methods:
SEM imaging, N₂ gas sorption (BET analysis), IR spectroscopy, NMR, Die sorption, TGA
- Developing a novel powder coating for energy recovery exchangers
- Conducting performance testing of lab-scale energy recovery exchangers
- Proposing a new bio-desiccant (high amylose starch) as an alternative desiccant to coat energy recovery exchangers
- Presenting research results at academic conferences and peer-reviewed journal
- Conducting laboratory and tutorial sessions for new graduate and undergraduate students

Jan-Apr 2016

Instructor, Fluid Mechanics II (3rd year course, 83 students)

Dept. of Mechanical Engineering, University of Saskatchewan, Saskatoon

Sep-Dec 2015

Instructor, Thermodynamics I (2nd course, 102 students)

Dept. of Mechanical Engineering, University of Saskatchewan, Saskatoon

- Attending the lectures and introducing students with the course materials
- Preparing the course materials including the presentation slides, semi-notes assignments, and tutorials
- Coordinating weekly laboratory sessions for the course with giving the introductions to the teaching assistants and lab demonstrators
- Effective communication with departmental head and undergraduate chair through bi-weekly meeting to meet the departmental learning outcome and university assessment policies
- Employing various assessments methods (midterm, final, quiz) to evaluate learning objectives
- Interactive teaching through online university interface and high-level participatory activities, open-door policy

Sep 2012- Apr 2015

Teaching Assistant and Lab Demonstrator

College of Engineering, University of Saskatchewan, Saskatoon

Courses: Fluid Mechanics I, Thermodynamics I, Experimental Laboratory, Manufacturing Process, Engineering Mechanics I & II (Statics & Dynamics)

- Assisting professors in organizing and preparing reference materials preparation and administration of exams, grading exams, term papers laboratory reports, and quizzes
- Presenting analytical background and experimental procedure for groups of students
- Organizing laboratory sessions, supervising students through the experiments, and ensuring the safety requirements
- More than 1500 hours of TA and LD experience in various undergraduate courses

Aug 2010-Sep 2011

Research Assistant and Laboratory Technician

Combustion Laboratory, Sharif University of Technology, Tehran, Iran

- Experimental visualization of acoustically perturbed laminar combustion with heat release measurements, flame image processing
- Modifying available test facility (developed through my M.Sc.) to extend application and enhance the detectors
- Preparing and updating lab safety sheets according to the domestic regulations
- Preparing technical reports and proposal for industrial partner
- Collecting literature and sorting the technical documents gas turbines
- Performing simple educational experiments for undergraduate courses

July-Dec 2007

Project Engineer

Day Tahviah Inc. Tehran, Iran

- Testing, Adjusting, and Balancing (TAB) of Ventilation System Test Group at Tehran International Tower
- Taking Measurements Indoor Air Quality (IAQ) to check for acceptable ventilation rates, thermal comfort, and indoor air pollutant
- Performance testing of ventilation systems (indirect cooling systems and desiccant dehumidifiers) and energy recovery ventilators (ERV)
- Estimating the sensible and latent load for the installed HVAC system and performing annual cost analysis

Jan 2008-June 2009

Teaching Assistant and Lab Demonstrator

Dept. of Aerospace Engineering, Sharif University of Technology, Tehran, Iran

Courses: Advanced mathematics (Graduate Course), Fluid Mechanics I, Fundamental of Combustion, Strategic Management, Aerodynamics I

- Assisting instructors in organizing and preparing reference materials
- Assisting professors in preparation and administration of exams, grading exams, term papers, laboratory reports, and quizzes
- Running experiments for students and ensuring the lab safety

AWARDS & RECOGNITIONS

- March 2016 • Interdisciplinary Research Excellence, 4th Annual Graduate Student Award Gala, University of Saskatchewan
- March 2016 • College of Engineering Graduate Student Awards, Russell William Haid Memorial Awards (\$5,000)
- June 2015 • Best poster presentation award, the 4th annual meeting of NSERC Smart Net-Zero Energy Building Strategic Research Network (SNEBRN) , Saskatoon, Canada
- May 2015 • NSERC Engage project grant (\$25,000)
- Apr 2015 • Devolved Graduate Scholarship of Department of Mechanical Engineering, University of Saskatchewan (\$21,000)
- May 2014 • Saskatchewan Innovation & Opportunity Scholarship (\$10,000)
- Apr 2014 • Devolved Graduate Scholarship of Department of Mechanical Engineering, University of Saskatchewan (\$21,000)
- Apr 2012 • College of Engineering Graduate Student Awards, Frederick Wheeler & W.H.T. Spary Graduate Scholarship (\$3,000)
- July 2007 • Ranked 5th among 15,000 competitors in a nationwide university entrance exam for Master of Science in Aerospace Engineering majors

TECHNICAL SKILLS & CERTIFICATES

- Teaching Certificate: Instructional Skills Workshop (ISW), Gwenna Moss Centre for Teaching Effectiveness, University of Saskatchewan (Dec 2016)
- Foundation of Project Management, MITACS, University of Saskatchewan (May 2012)
- Laboratory Safety, Workplace Safety and Environmental Protection, University of Saskatchewan (Jan 2012)
- Technical Software: MATLAB, LABView, TRNSYS, SolidWorks, CATIA, Origin, ANSYS
- Laboratory Skills & Detection Devices: Familiar with Sensors and Data Acquisition Systems, Scanning Elector Microscope (SEM), Gas Adsorption Measurements (Micrometerics ASAP 2002), Laser Particle Size Analyzer, Fine Powder Coating, IR spectroscopy, etc.
- Solid background on mathematics and analytical methods to analyze heat and mass flows in thermal systems
- Expert in MS Windows and MS Office (Word, Excel, Power Point, Publisher)

**PEER-REVIEWED
JOURNAL
PUBLICATIONS**

1. F. Fathieh, L. Dehabadi, L. D. Wilson, R. W. Besant, R. W. Evitts, C. J. Simonson, "Sorption Study of a Starch Biopolymer as an Alternative Adsorbent for Energy Wheels", *ACS Sustainable Chemistry & Engineering*, 4 (3), pp. 1262-1273, 2016.
2. F. Fathieh, R. W. Besant, R. W. Evitts, C. J. Simonson, "Effects of Heat Loss/Gain on the Sensible Effectiveness of Heat Wheels Determining from Transient Single Step Testing", *ASME Journal of Thermal Science and Engineering Application*, 8 (3), 12 pp. , 2016.
3. M. Rafati Nasr, F. Fathieh, D. Kadylak, and C. J. Simonson, "Experimental Methods of Detecting Frosting in Cross-flow Air-to-Air Energy Exchanger", *Experimental Thermal and Fluid Science*, 77, pp. 100-115, 2016.
4. P. Liu, M. Rafati Nasr, G. Ge, M. Justo Alonso, H.M. Mathisen, F. Fathieh, C.J. Simonson, "A theoretical model to predict frosting limits in cross-flow air-to-air flat plate heat/energy exchangers", *Energy and Building*, 110, pp 404-414, 2016.
5. M. Naghash, F. Fathieh, R. W. Besant, R. W. Evitts, C. J. Simonson, "Measurement of Convective Heat Transfer Coefficient in a Randomly Packed Beds of Silica Gel Particles Using IHTP Analysis", *Applied Thermal Engineering*, 106 (5), pp. 361-370, 2016.
6. F. Fathieh, R. W. Besant, R. W. Evitts, C. J. Simonson, "Determination of air-to-air heat wheel sensible effectiveness using temperature step change data", *International Journal of Heat and Mass Transfer*, 87, pp 312-326, 2015.
7. L. Dehabadi, F. Fathieh, L. D. Wilson, R., R. W. Evitts, C. J. Simonson," Study of Dehumidification and Regeneration in a Starch Coated Energy Wheel", *ACS Sustainable Chemistry & Engineering*, Submitted, June 2016.
8. F. Fathieh, M. Rafati Nasr, S. Sadeh, R. W. Besant, R. W. Evitts, J. Müller, C. J. Simonson, "Determination of Air-to-Air Energy Wheels Latent Effectiveness Using Humidity Step Test Data", *International Journal of Heat and Mass Transfer*, 103, pp. 501-515, 2016.
9. F. Fathieh, A. Khosousi, M. Farshchi, and A. Ghafourian, "Analytical Investigation of the Effects of Mass Fraction Oscillations on Laminar Diffusion Flame Structure and Heat Release Rate", *Fuel and Combustion*, 4 (1), pp. 31-43, 2011.

**CONFERENCE
PAPERS AND
PRESENTATIONS**

1. F. Fathieh, R. W. Besant, R. W. Evitts, C. J. Simonson, " Effects of Physical and Sorption Properties of Silica Gel on Performance of Energy Wheels", *poster presentation in the ASHRAE Regional Conference*, Saskatoon, Canada, May 2016.
2. M. Rafati Nasr, J.L. Zhang, F. Fathieh, A. S. Fung, C.J. Simonson, "Energy impact of frosting-defrosting in HRV/ERVs", *poster presentation in 4th annual meeting of NSERC Smart Net-Zero Energy Building Strategic Research Network (SNEBRN)*, Saskatoon, Canada, May 2015.
3. F. Fathieh, R. W. Besant, R. W. Evitts, C. J. Simonson, "Sorption Changes after Milling Silica Gel Particles to Micron Sizes", *Proceedings of the 24th Canadian Conference of Applied Mechanic (CANCAM)*, Saskatoon, Sk, Canada, June 2013.
4. M. Naghash, F. Fathieh, R. W. Besant, R. W. Evitts, X. Nie, "Inverse Estimation of Parameters Method to Determine Convection Coefficient with Flow through

- Randomly Packed Particle Bed”, *Proceedings of the 24th Canadian Conference of Applied Mechanic (CANCAM)*, Saskatoon, Sk, Canada, June 2013.
5. A. Khosousi, F. Fathieh, M. Farshchi, and A. Ghafourian, "Analytical Study of a Laminar Diffusion Flame Response to Flow Field Oscillations," *7th Mediterranean Combustion Symposium*, Sardinia, Italy, Sep. 11-15, 2011.
 6. A. Khosousi, F. Fathieh, M. Farshchi, and E. Azimizadeh, "Analytical Investigation of the Effects of Mass Fraction Oscillations on Laminar Diffusion Flames," *3rd Fuel and Combustion Conference of Iran*, Amirkabir University of Technology, Tehran, Iran, Feb. 22-23, 2010.
 7. E. Azimizadeh, M. Farshchi, F. Fathieh, and A. Khosousi, "Experimental Study of Non-Premixed Combustion with Preheated Air and high recirculation," *3rd Fuel and Combustion Conference of Iran*, Amirkabir University of Technology, Tehran, Iran, Feb. 22-23, 2010.
 8. A. Gholizade, A. Ghafourian, F. Fathieh, and A. Khosousi, "Analytical and Experimental Research of Premixed Flame Length in Turbulent Flow," *7th conference of Iranian Aerospace Society*, Sharif University of Technology, Tehran, Iran, Feb. 19-21, 2008.

**VOLUNTEERING
& MEMBERSHIP**

- Member of ASME, ASHRAE, and ACS
- Recognized reviewer by Elsevier, Int. J. of Heat and Mass Transfer, (Aug 2015)
- President of Persian Students' Association, University of Saskatchewan, (2014)
- Vice President of Persian Students' Association, University of Saskatchewan (2013)
- Travel Award Committee, Graduate Student Association, (May 2013)
- Executive External Affair, Sharif Students' Music Associations, (2004)

**EXTRA-
CURRICULAR**

- Musician, a member of Nava, Saba, and Chakavak Ensembles performed in several international festivals
- Recognized performed in National Fajr Music Festival (Feb. 2000)
- A Soccer player in Saskatoon United Nation Team
- Hiking, Camping, and Landscape photography