

Min Che -- <https://www.linkedin.com/in/mincheacrc/>

Tel.: 217 778 9662

Email: chemin228@gmail.com

Address: 612 Breen Dr. Champaign, IL 61820

EDUCATION

University of Illinois at Urbana-Champaign

Jun 2021

PhD candidate in Mechanical Engineering

Thesis Title: "Development of an Absorption-Based Experimental Method and Investigation of Air-Side Local Heat Transfer Coefficient on Heat Exchanger Fins"

Ocean University of China

July 2014

Master of Business Administration (MBA)

Shandong University

Bachelor of Engineering (specialty in thermal energy and power engineering)

Sep 2004

WORK EXPERIENCE

Department of Mechanical Science and Engineering, Urbana, IL

Graduate Research Assistant-Air Conditioning and Refrigeration Center (ACRC) May 2017-Present

- Designed and built a wind tunnel according to ASHRAE standard with automatic data acquisition
- Designed, modeled, and verified the ammonia mixing system with precision concentration control at ppm level with cost under 50 USD
- Applied spray coating on heat exchanger fin surfaces, conducted coating thickness measurements
- Processed heat and mass transfer experiment by using the color change coating and utilized MATLAB for image processing and color analysis, achieving local heat transfer quantification on heat exchangers
- Built numerical model (CFD) for heat exchanger fins, utilized experimental data to improve the model

Haier Open Innovation Center, Qingdao (Headquarters), China

Project Manager

Oct 2010-Sep 2016

- *Innovation of family appliances*: proposed, planned, and supervised four projects. Estimated project budget, schedule, consumers, risk and potential revenue
- Administered cross-functional teams up to 16, coordinating with other departments until product launch.
- *Water recycle washer*: identified three techniques to save water, coordinated technical cooperation and conducted fast prototyping and evaluation in the joint lab to design a dosing system with a cost within 20 USD. Drafted and proposed one standard, applied for 70 patents. (1M USD prototype budget)
- *Instantaneous heat pump water heater*: proposed the idea of integrating washer, drier and heat pump system, designed the heat pump system, built CFD model and improved the structure of the water tank to enhance mixing. (0.2M USD prototype budget)
- *Residential dry-cleaning machine*: designed and verified the chemical recovery system by using the absorption cooling system

TRANE Asia-Pacific R & D Center, Shanghai, China

Refrigeration System Engineer

Sep 2007-Sep 2010

- Designed and modeled the refrigeration system for refrigerant replacement on unitary air conditioner
- Drafted test plans according to AHRI & UL standards, conducted experiments on prototypes, analyzed data, created test reports, supported product certification and cost reduction, generated catalog
- Evaluated components: designed heat exchangers, plotted operation envelopes for compressors, generated fan curves, decided TXV settings, and conducted trouble shooting on compressor failures, vibration failures, system reliabilities issues and noise
- Applied micro-channel condensers on rooftops, investigated refrigerant maldistribution

LG Air Conditioning, Qingdao, China

Mar 2005-Sep 2007

Engineer in R&D

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- Designed shell-and-tube heat exchangers and implemented cost reduction for absorption water chillers
- Localized design of two prototypes of gas engine driven air source heat pump (GHP)

JOURNAL PUBLICATIONS

Che, M., & Elbel, S. (2021). Experimental study of local air-side heat transfer coefficient on real-scale heat exchanger fins by employing an absorption-based mass transfer method. *Applied Thermal Engineering*, 116718.

Che, M., & Elbel, S. (2019). An experimental method to quantify local air-side heat transfer coefficient through mass transfer measurements utilizing color change coatings. *International Journal of Heat and Mass Transfer*, 144, 118624.

CONFERENCE PRESENTATIONS

Che, M., & Elbel, S. (2021). Experimental Evaluation of Local Air-Side Heat Transfer Coefficient on Single Fins. The 18th International Refrigeration and Air Conditioning Conference. Paper 2176.

Che, M., & Elbel, S. (2021). Application of a Color Change Coating to Evaluate Flow Velocity Distribution and Wall Shear Stress of Fan Blade. The 18th International Refrigeration and Air Conditioning Conference. Paper 2177.

Che, M., & Elbel, S. (2019). Measurement of local air-side heat transfer coefficient through absorption-based optical method. The 9th International Conference on Compressor and Refrigeration. Paper 1122.

Che, M., & Elbel, S. (2019). Quantification of local air-side heat transfer coefficient using color-change coatings. 14th International Conference of Heat Transfer. Paper 151 (best paper award).

Che, M., & Elbel, S. (2019). Development of a new optical method to quantify local air-side heat transfer coefficient. 25th IIR International Congress of Refrigeration. Paper 1541.

Che, M., & Elbel, S. (2019). Application of a new method to quantify local air-side heat transfer coefficient on fundamental geometries. 25th IIR International Congress of Refrigeration. Paper 1543.

Che, M., & Elbel, S. (2018). Novel Visualization Method to Quantify Local Air-side Heat Transfer Coefficient. The 17th International Refrigeration and Air Conditioning Conference. Paper 2176.

AWARDS

- David Hinde Memorial Award (outstanding researcher in natural refrigerant technology) Mar 2020
- Outstanding Paper Award (best paper of International Conference of Heat Transfer) Jul 2019
- Central Illinois ASHRAE scholarship 2018
- Best employee award - TRANE Asia Sourcing & Design Center 2008

SKILLS

- Refrigeration system simulation/calculation (T-Rex, UP2, EES, MATLAB, Python)
- Structure design: (SolidWorks, AutoCAD)
- Modeling of heat transfer, fluid mixing (ANSYS Fluent)
- Designing and building test platform, machining, using hand tools and sensors calibration, conducting automatic experimental data acquisition with data logger and LabVIEW/Simulink
- Conducting experiments, trouble shooting, data analysis, test reporting
- Coating, surface measurements with optical microscope and atomic force microscope
- 6 Sigma Green Belt from Trane