

# RONG YU

## Contact:

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## Address:

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## Summary

- Strong fundamental understanding of heat transfer, fluid mechanics, and thermodynamics; seven years of research experience in HVAC&R applications.
- Expertise in the use of advanced fabrication and analysis instrument, and designing, testing and modeling of HVAC&R systems.
- Proficient with simulation tools such as VapCyc, CoilDesigner, EES, and MATLAB.

## Education

### University of Illinois at Urbana-Champaign, IL

*Ph.D. in Mechanical Science and Engineering*, expected November 2016

Research: Liquid-infused slippery surfaces for AC&R applications

Advisor: Professor Anthony M. Jacobi

GPA 3.89/4.00

### MIAMI UNIVERSITY at Oxford, OH

*M.S. in Chemical and Paper Engineering*, August 2011

Thesis: Novel heat exchanger fin surface design for improved condensate management

Advisor: Professor Andrew D. Sommers

GPA 3.89/4.00; *Graduate School Travel Grant*

### LIAONING UNIVERSITY, China

*B.S. in BioScience*, June 2009

GPA 92.2%; Class Ranking: 1/30; *Outstanding Student Scholarship*

## Working Experience

### Heat Transfer Engineer Intern in Advanced Technology Department

May/2016-August/2016

### Daikin Goodman Manufacturing Inc.

- Heat exchanger circuitry design and system simulation for residential split systems.
- Conduct AHRI rating test for HVAC&R systems in environmental psychrometric test chambers, collect and analyze data to evaluate the system performance.
- Coordinate with other teammates to work on failure mode and effects analysis (FMEA).
- Study combinations of lubricants and aluminum for best performance with lowest cost.

## Research Experience

### Graduate Research Assistant

### Air Conditioning & Refrigeration Center, UIUC

December/2011-Present

#### *Liquid-infused slippery surface for HVAC&R applications*

- Designed iteratively and fabricated nanostructured surfaces for HVAC&R systems to minimize water retention and retard frost formation on heat transfer surfaces.
- Developed a real time hardware control and feedback using LabVIEW, and a data reduction using EES and MATLAB.
- Performed reliability test under frosting/defrosting cycles and highly accelerated life test (HALT); achieved robust slippery surface designs for industrial applications.

#### *Flow boiling of refrigerants in metal foams*

- Evaluated the heat transfer and pressure drop behavior for flow boiling of R134a in metal foams, and compared the experimental data to modified flow regime map.
- Established a heat transfer model of a two phase flow in a square tube.

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## Department of Mechanical Engineering, MU

August/2009-August/2011

### *Novel heat exchanger fin surface design for improved condensate management*

- Performed test facility design, construction, and a data acquisition system setup following ASHRAE test standard.
- Designed and fabricated air-side heat exchangers with different surface morphologies.
- Experimentally investigated and compared the thermal-hydraulic performance of full-scale heat exchangers with various fins under both dry and wet conditions using a wind tunnel.

## Professional Activities

**Conference session chair:** ASME 2015 conference on SMASIS

September/2015

### **Technical Conference and Journal Paper Reviewer**

2013-Present

- ASME International Mechanical Engineering Congress & Exposition (IMECE-2014)
- ASME 12<sup>th</sup> Int'l Conference on Fuel Cell Science, Engineering and Technology (2014)
- ASME Heat Transfer Conference (HT-2013)
- HVAC&R Research

**Member:** ASHRAE, ASME

## Skills

**Computer:** MATLAB, Engineering Equation Solver (EES), ANSYS Fluent, Simulink, LabVIEW, CoilDesigner, VapCyc, AutoCAD, Solidworks, Origin, Kaleidagraph, MS Office

### **Cleanroom experience:**

Microfabrication (*lithography, etching, anodization*), Coating deposition (*PVD, CVD, MVD*), Surface characterization techniques (*SEM, XPS, X-ray CT, Profilometer, Goniometer*)

### **Other laboratory skills:**

Iterative experimental design, Instrumentation calibration techniques, Data acquisition, Uncertainty analysis, Infrared thermography, Thermal anemometry

**Languages:** English, Mandarin

## Publications

### **Selected Publications**

- Rong Yu, A.M. Jacobi, "Water-repellent slippery surfaces for HVAC&R systems," *ASME 2015 Conference on SMASIS*.
- Rong Yu, A.M. Jacobi, "Self-healing, slippery surfaces for HVAC&R systems," *15<sup>th</sup> Int'l Refrigeration and Air Conditioning Conference at Purdue*, 2014.
- Rong Yu, A.D. Sommers, N.C. Okamoto, "Effect of a micro-grooved fin surface design on the air-side thermal-hydraulic performance of a plain fin-and-tube heat exchanger," *Int'l J. of Refrigeration* 36, 1078-1089, 2013.
- A.D. Sommers, Rong Yu, N.C. Okamoto, "Condensate drainage performance of a plain-fin-and-tube heat exchanger constructed from anisotropic micro-grooved fins," *Int'l J. of Refrigeration* 35, 1766-1778, 2012.
- Rong Yu, A.D. Sommers, N.C. Okamoto, "Impact of an anisotropic fin surface design on the thermal-hydraulic performance of a plain-fin-and-tube heat exchanger," *ASME Int'l Mechanical Engineering Congress & Exposition*, 2011.
- Rong Yu, A.D. Sommers, N.C. Okamoto, "Anisotropic heat exchanger fin surface design for improved condensate management," *Int'l Conference on AC&R at Korea*, 2011.