GUSTAVO MARQUES HOBOLD

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INTERESTS

Safe battery chemistries	Next-gen energy storage	Energy safety
Energy policy	Machine learning-enabled physics	Thermal analysis

EDUCATION

Massachusetts Institute of Technology *Ph.D. in Mechanical Engineering* 2018 – present

Dissertation**:** Enabling safe battery chemistries

Advisor**:** Betar M. Gallant

Federal University of Santa Catarina *Master in Mechanical Engineering* 2015 – 2018

Thesis: Efficient thermal transport: a study of single-phase, phase-change and supercritical heat transfer

Advisor: Alexandre K. da Silva

Federal University of Santa Catarina *Engineer's degree, Mechanical Engineering* 2010 – 2015

Thesis: Combined heat transfer and fluid flow phenomena in the neighborhood of the thermodynamic critical point

Advisor: Alexandre K. da Silva

RESEARCH AND PROFESSIONAL APPOINTMENTS

Massachusetts Institute of Technology, Cambridge, MA 2018 – present

Graduate research assistant

The University of Texas at Austin, Austin, TX 2016

Visiting scholar, Host: John R. Howell

Federal University of Santa Catarina, Florianópolis, Brazil 2015 – 2018

Graduate research assistant

Raytheon Missile Systems, Tucson, AZ, USA 2013

Intern

Washington University in St. Louis, St. Louis, MO 2012 – 2013

Undergraduate research assistant

Federal University of Santa Catarina, Florianópolis, Brazil 2011 – 2015

Undergraduate research assistant

TEACHING EXPERIENCE

Federal University of Santa Catarina, Florianópolis, Brazil

Heat Transfer II (2017.1):	Upper undergraduate course covering convective heat transfer, heat exchangers and phase change phenomena – taught recitations and held office hours.
Transport Phenomena (2017.1):	Upper undergraduate course covering fluid mechanics and heat and mass transfer – taught lectures, recitations and held office hours.
Introduction to Mechanical Engineering (2010.2 – 2012.1):	Freshman undergraduate course – assisted in maintaining the course's webpage.

DISTINCTIONS AND AWARDS

ABCM-Embraer Master Thesis Award, *Assoc. of Mechanical Sciences & Embraer, Brazil* 2018

Douglas G. and Sara G. Bailey Fellowship, *Massachusetts Institute of Technology* 2018

ABCM-Embraer Undergraduate Thesis Award, *Assoc. of Mechanical Sciences & Embraer, Brazil* 2015

CNPq Fellowship, *Ministry of Education, Brazil* 2015

Academic Performance Certificate, *Federal University of Santa Catarina, Brazil* 2013 – 2015

Brazil Scientific Mobility Scholarship, *Ministry of Education, Brazil* 2012

SERVICE

Reviewer for journals:

International Journal of Thermal Sciences, Applied Energy, Energy Conversion and Management

Federal University of Santa Catarina, Florianópolis, Brazil

Graduate student representative 2016 – 2017

JOURNAL PUBLICATIONS

12 Automatic detection of the onset of film boiling using convolutional neural networks and Bayesian statistics

Hobold, G. M. and da Silva, A. K.

International Journal of Heat and Mass Transfer (accepted, in press)

11 Visualization-based nucleate boiling heat flux quantification using machine learning

Hobold, G. M. and da Silva, A. K.

International Journal of Heat and Mass Transfer (accepted, in press)

10 On the sensitivity to convective heat transfer correlation uncertainties in supercritical fluids
Scariot, V K., **Hobold, G. M.** and da Silva, A. K.
Applied Thermal Engineering 145, p. 123-132, 2018

9 Machine learning classification of boiling regimes with low speed, direct and indirect visualization
Hobold, G. M. and da Silva, A. K.,
International Journal of Heat and Mass Transfer, 125, p. 1296-1309, 2018

8 Dimensionless, fluid-independent equations for heat and momentum transfer in supercritical fluids
Hobold, G. M. and da Silva, A. K.
The Journal of Supercritical Fluids 133.1, p. 17-29, 2018

7 Critical phenomena and their effect on thermal energy storage in supercritical fluids
Hobold, G. M. and da Silva, A. K.
Applied Energy 205, p. 1447-1458, 2017

6 A generalized multifluid optimal pressure for heat exchangers operating with supercritical fluid
Hobold, G. M. and da Silva, A. K.
Numerical Heat Transfer, Part A: Applications 72.5, p. 345-354, 2017

5 Two-dimensional porosity optimization of saturated porous media for maximal thermal performance under forced convection
Hobold, G. M. and da Silva, A. K.
International Journal of Heat and Mass Transfer 101, p. 1689-1701, 2017

4 Performance optimization of a channel flow problem using shape functions
Hobold, G. M. and da Silva, A. K.
International Journal of Heat and Mass Transfer 108, p. 303-312, 2016

3 Thermal behavior of supercritical fluids near the critical point
Hobold, G. M. and da Silva, A. K.
Numerical Heat Transfer, Part A: Applications 69.6, p. 545-557., 2016

2 A methodology for predicting solar power incidence on airfoils and their optimization for solar powered airplanes
Hobold, G. M. and Agarwal, R.
Proceedings of the Institution of Mechanical Engineers, Part G: Journal of Aerospace Engineering 229.7, p. 1267-1279, 2015

1 Prediction and optimization of fuel cell performance using a multi-objective genetic algorithm
Hobold, G. M. and Agarwal, R.
International Journal of Energy and Environment 4.5, p.721-742, 2013

CONFERENCE PUBLICATIONS

3 Analysis of neural network architecture for pool boiling regime identification

Hobold, G. M. and da Silva, A. K., ,

10th International Conference on Boiling & Condensation Heat Transfer, ICBCHT 2018, Nagasaki, Japan, 2018

2 Application of the Force Cone Method in topology optimization: a case study on truss design

da Veiga, A. P., **Hobold, G. M.** and de Castro, R. L.

23rd ABCM International Congress of Mechanical Engineering, COBEM 2015, Rio de Janeiro, Brazil, 2015

1 A Methodology for Predicting Solar Power Incidence on Airfoils and their Optimization for Solar Powered Airplanes

Hobold, G. M. and Agarwal, R.

SAE 2013 AeroTech Congress & Exhibition, Montréal, Canada, 2013-01-2320, 2013

INVITED TALK

2015 ABCM-Embraer Award Talk

23rd ABCM International Congress of Mechanical Engineering, COBEM 2015, Rio de Janeiro, Brazil.

Talk: Combined heat transfer and fluid flow phenomena in the neighborhood of the thermodynamic critical point