Hongru Du

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Apt.830 1402 Regent Street
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EDUCATION

Ph.D Civil Engineering, Johns Hopkins University — Start from 2019Fall
M.S. Industrial Engineering, University of Wisconsin-Madison — 09/2017-12/2018
B.S. (Hons), Chemistry with Material Chemistry, The University of Edinburgh — 09/2015-07/2017
B.E. Chemical Engineering, Tianjin University, CHN — 09/2013-07/2015

PUBLICATIONS

- **H. Du,** Y. Zhou, V. Bier, *"Game-theoretic Modeling of Pre-disaster Relocation"*, submitted to Engineering Economist.
- H. Kou, H. Luo, **H. Du**, P. Du, F. Lang, B. Lin, "*Research on Application of High-Power CO_2 Heat Pump Hot Water System by Central Heating of Large Temperature Difference and Low Flow in Cold Regions*", Building Energy and Environment, ISSN: 1003-0344, 2017.
- H. Kou, H. Luo, **H. Du**, "*Research on the Quality of CO_2 Heat Pump at Low Temperature*", Low Temperature Architecture Technology, ISSN: 1001-6864, 2016, 38(11).
- H. Dou, H. Luo, **H. Du**, "*An Experimental Study of the Effects of Inlet Water Temperature of Air Source Carbon Dioxide Heat Pump under Low-Temperature Climate Conditions*", Journal of Chemical Industry and Engineering, ISSN: 0438-1157, 2016.

PATENTS

- Utility Model Patent: *Adjust the Distribution of Aridity Agree of CO_2 to Promote the Heat Exchange of Evaporator*. Patent Number: Zl 2016 2 0015078.5.
- Patent for Invention: *Using Two Phases Separation Apparatus to Improve the Efficiency of CO_2 Heat Pump System*. Patent Number: CN 105485951 A.

CONFERENCES ATTENDED

- INFORMS Annual Meeting — Nov. 2018, Phoenix, AZ
  Presentation: **H. Du,** Y. Zhou, V. Bier, *"Game-theoretic Modeling of Pre-disaster Relocation", INFORMS* conference 2018, phoenix, 2018.
- Edinburgh University Chemistry 3 Practical Research, *"The Lithium-ion Battery "*, UK, March 2016.
- Chinese Association of Refrigeration, *"Investigation of Using CO2 Heat Pump as Heating Installation"*, CHN, November 2015.

ACADEMIC EXPERIENCES

Advanced Health Accessed Project — 09/2018-Present

Supervised by Prof. Jingshan Li; Department of Industrial & System Engineering, UW-Madison

- Applying scheduling and simulation methods to try and match supply with demand in primary care.
- Collect data from SSM Health Hospital, assign patient and hospital visits into certain groups and the rescheduling the appointment method under present panel size.
- Try to find a balanced waiting time between different types of visits.

Optimal Strategy for Pre-Disaster Relocation — 10/2017- Present

Supervised by Prof. Vicki Bier; Department of Industrial & System Engineering, UW-Madison

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- Built a game theoretic model with Matlab between government and residents, set the government discount rate lower than residents.
- Using two-parameter Rayleigh distribution to model the probability of upcoming floods. The find that government can benefit by offering a subside prior to the floods.
- Used R to do all the sensitive analysis to the major parameters like the discount rate for residents and government, the scope of probability distribution function and the unit moving cost for residents of basic model**.**
- Built up extended model with an annual benefit after relocation and applied basic model under hyperbolic discounting rate.

Investment of a Novel Polymer with Potential Gas Separation Property 09/2016-04/2017

Supervised by Prof. Neil Mckeown; School of Chemistry, The University of Edinburgh

- Utilized triptycene to make polyamides with a microporous structure and used as selective gas separation membranes.
- Determined the structure with NMR and IR spectroscopies, used ACD to model the structure and predicted the potential property.

Simulate the Performance of CO2 Heat Pump at Low Temperature 09/2015-05/2016

Supervised by Prof. Yitai Ma & Prof. Huilong Luo; Tianjin University Thermal Power Research Institute

- Built a mathematical model of thermal dynamic system for CO2 heat pump and run experimental test under different conditions.
- Used C++ language to build up the parameters calculation program.
- Constructed PID control system and predicted the precision of transducer by analyzing the data from different working cycles.

OTHER INFORMATION

- **Professional Skills:** Matlab, Julia programming, Python, Arena simulation, COSMOtherm, Statistical Modules in OriginLab, ChemDraw, ACD/Labs
- **Awards:** International Student Scholarship (2015-2017), The University of Edinburgh, UK
  First Prize of Tianjin Environmental Protection Science and Technology