DONGHUA UNIVERSITY ENGLISH-TAUGHT MASTER'S DEGREE PROGRAMS

School of Environmental Science and Engineering

NAME OF THE PROGRAM

Civil Engineering

(Heating, Ventilation and Air-Conditioning Engineering)

土木工程（供热供燃气通风及空调工程）

RESEARCH DIRECTIONS:

- Air Quality Control Technology for Building Environment
- Industrial Ventilation and Gas Purification Technology
- Building Energy Conservation and Sustainable Energies for Buildings
- Clean Utilization of Energy and Pollutant Emission Reduction

TYPE OF THE DEGREE: Academic Degree

DEGREE CONFERRED: Master of Engineering (Civil Engineering)

SCHOOLING: 3 years

1、BRIEF INTRODUCTION

Donghua University, nestled in the vibrant city of Shanghai, is a distinguished Chinese institution that has been offering a Master's program in Heating, Ventilation, and Air-conditioning Engineering (HVAC) for 40 years originating from the very beginning of the Curriculum Teaching and Research Section of Thermal Dynamics and Heat Transfer since 1951. In the crucial years of 1960 and 1961, the University responded to the nation's urgent demand by admitting two classes of undergraduate students specializing in textile HVAC. This strategic move significantly contributed to addressing the country's demand for professionals, adept in optimizing temperature, humidity, and indoor air quality within textile factory workshops. Starting from 1982, the University started recruiting undergraduate students in HVAC engineering. The bachelor's program HVAC, now known as the Built Environment and Energy Engineering (BEEE), has consistently received accreditation in the National Professional Evaluation in 2003, 2008, 2013 and 2018. This consistent recognition manifests the program's continual commitment to excellence and high education standards. More importantly, in 2020, this program was acknowledged as the China's National first-class undergraduate major. This prestigious recognition underscores the program's leading position in the major throughout China.

Donghua University has a long-standing legacy in HVAC education. In 1984, the University began admitting graduate students in HVAC, and within just two years, in 1986, it earned the authorization from the Ministry of Education of China to confer Master's degrees (Master of Engineering) in this field. This was followed by the additional of professional Master's degrees in Architecture and Civil Engineering in 2003, and the qualification to confer Ph.D. degrees in HVAC in 2006. Understanding the need for evaluating the standards of advanced education, the Ministry of Education of China requires all universities offering Ph.D. programs should award the degree in first level discipline. Accordingly, HVAC was incorporated into the Civil Engineering, the first-level discipline. Following a rigorous evaluation process, the University was successfully granted the authority to confer doctoral degrees in Civil Engineering since 2018.

Today, the University is recognized as one of the premier universities in China for a Ph.D. in Civil Engineering with a focus on HVAC. Each year, it welcomes about 80 graduate students, consisting of approximately 65-70 Master's students and 10 Ph.D. candidates. As of 2023, the University has conferred MS or Ph.D. degrees to approximately 1000 distinguished students.

At present, the Department of Built Environment and Energy Engineering boasts a robust team of 25 full-time faculty members, which includes 9 full professors (7 of whom are qualified doctoral supervisors), 12 associate professors, and 4 assistant professors. This diverse group of educators bring a wealth of international experience, with 17 out of the 25 faculty members having pursued academic studies or research for at least a year in countries or regions such as the USA, UK, Germany, Sweden, Australia and Hong Kong S.A.R. of China, among others. Each professor in the department holds a Ph.D. degree from prestigious universities in and outside China.

The University's HVAC major under the first-level discipline of Civil Engineering is renowned for its

cutting-edge research in critical areas such as indoor air quality control, ventilation technologies, thermal comfort of the built environment, building energy conservation, the application of renewable and sustainable energies for buildings, and clean utilization of energy and pollutant emission reduction. The research is widely supported by significant external funding from both governmental bodies and industries. This includes the National Natural Science Foundation of China (NSFC), the Ph.D. Programs Foundation of Ministry of Education of China, and the Research Plan of the Ministry of Science and Technology of China via initiatives such as "973" and "863" programs. We also receive various fundings from Shanghai Municipal government and numerous industry sources. Our research findings are frequently published in prestigious international and domestic academic journals, including but not limited to Building and Environment, Energy and Buildings, Chemical Engineering Journal, Fuel, Energy, Energy Conversion and Management, Solar Energy, Renewable Energy, International Journal of Heat and Mass Transfer, Applied Thermal Engineering, and Sustainable Cities and Society. Our esteemed faculty have been the recipients of numerous prestigious awards, underlining the recognition and respect our department commands in this field. Honors include the Shanghai Science and Technology Progress Award in 2023, Shanghai Natural Science Award in 2016, and the Science and Technology Award from various Chinese Societies.

The labs here provide the necessary devices, analyzers and test platforms to support the high level research work. The labs are also inclusive spaces, with public laboratories being accessible to all students within the School and the University, fostering a culture of shared knowledge and collaboration. For more specialized research, our professors manage dedicated laboratories, each with its own distinct focus. A few notable examples include the Comprehensive Performance Experimental Platform for Gas Purification Filter Materials, the Experimental System for Indoor Air Quality and Thermal Comfort, the Ground Source Heat Pump Platform, the Energy Clean Utilization and Combustion Pollutant Control Platform, the Urban Haze Pollution and Aerosol Dynamics Experimental Platform, the Solar Refrigeration Platform, and the Artificial Climate Chamber. The test setups could be retrofitted and/or new test rigs could be designed and established on the basis of the research projects.

The school and the department are committed to fostering academic exchanges and collaborations by actively promoting visits to the institutions both locally and globally. Each year, we offer our graduate students the unique opportunity to present their research findings at national conferences across China, thereby broadening their academic horizons and enhancing their research capabilities. Some of the students could apply and receive the support by the University to attend international conference abroad. Concurrently, we extend invitations to esteemed professors from universities worldwide to deliver presentations at our institution, thereby encouraging an exchange of ideas and perspectives. All the graduate students have the chances and are encouraged to take part in these activities. The department has established the close collaborations with renowned universities such as the University of Nottingham, Purdue University, the University of Michigan, the University of Mississippi in the United States, the Royal Institute of Technology and Chalmers University in Sweden, the Institute of Energy and Fuel Processing Technology, Poland. These international relationships not only enrich our academic community but also

ensure that our graduate students remain at the forefront of their respective fields and keep a close step with the most cutting-edge researches in the world.

2、PROGRAM OBJECTIVES

The study programs are designed for international students from various backgrounds, particularly those interested in building engineering, energy engineering, and environmental science. These programs will provide training in the design of high-performance buildings and building systems, the judicious exploitation of the air quality sciences and cleaner energy utilization, via the use of contemporary technologies such as experiments, CFD simulations, programming, BIM.

The aim is to equip these students with the skills needed to become professionals in the field of building engineering and environmental sustainability. They will be trained to deal with the challenges of increasing building energy consumptions and air pollution and will be able to deliver optimal solutions for smart building environment and energy systems. These solutions could include elements such as, renewable energy driven integrated buildings HVAC systems, air cleaning for industrial and residential buildings, and more.

The skills that the students will acquire include but are not limited to: understanding and managing energy issues in buildings, optimizing buildings and built environments for thermal comfort and indoor air quality, and protecting building occupants from hazards such as indoor and industrial particulate or combustion pollutants. They will also be trained to improve the energy efficiency and safety of buildings and built environments. Through these programs, the students will become capable of working in interdisciplinary teams, and proficient in using modern technologies to address building environment and energy engineering challenges. They will be prepared to promote sustainable and safe environments for human habitation.

Upon graduation, students will be poised to engage in engineering enterprises, serve in government planning roles, and contribute to academic research. This includes, but is not limited to, the following: Engineering Enterprises: They can apply their knowledge in multiple sectors such as thermal engineering, air-conditioning engineering, HVAC engineering, gas engineering, water supply and drainage engineering. Their roles may span across R&D, manufacturing, engineering technology, commissioning, operation management, and system security. Government or Business Entities: They will be equipped to design and plan urban heating and gas supply systems, and contribute to the overall engineering planning in various government and business units. Academic Research: As part of the global academic community, they can serve as research members in universities or research institutes, either in their home countries or abroad.

In summary, our graduates will be well-prepared to leverage their expertise and skills in diverse fields, fostering innovation and sustainability in the engineering and environmental sectors.

3、CURRICULUM

1. The 1st & 2nd semesters: courses study
2. November of the 3rd semester: thesis proposal submission and report
3. March of the 6th semester: thesis draft and Pre-defense
4. March of the 6th semester: concealed evaluation on the thesis
5. May of the 6th semester: oral defense on thesis

Main Courses

1. 高等传热传质学（Advanced Heat and Mass Transfer）（Credit 3）

Course Description: This course is designed for the graduate students majored in Heating Ventilation and Air-conditioning and/or Energy and power Engineering. The main topics of this course include: (1) Basic introduction: Physical concepts; Molecular level; Fundamentals of momentum, heat and mass transfer; Modern applications of heat and mass transfer; (2) Heat conduction: Steady state heat conduction (One dimensional and multidimensional); Unsteady state heat conduction (Lumped analysis, one dimensional transient, multidimensional transient); Fourier transform method, Laplace transform method; Approximate analytical solution; Heat source function method; Melting and solidification; (3) Convective heat and mass transfer: Basic governing equations; Boundary layer approximation; Fully developed laminar flow; Turbulent Flow (*k* equation、*k*-epsilon equation); Natural convection; (4) Thermal radiation: Fundamentals and greenhouse effect; (5) Cases studies for coupled heat and mass transfer.

Prerequisites: Heat Transfer, Advanced Mathematics, Fluid Mechanics, etc.

2. 计算流体力学（Computational Fluid Dynamics）（credit 3）

Course Description: This course is designed for the graduate students majored in Heating Ventilation and Air-conditioning and/or Energy and power Engineering. The main contents of this course include: (1) Introduction to CFD; (2) Conservation laws of fluid motion and the equations (3) Turbulence and its modelling; (4)The finite volume method for diffusion problems; (5) The finite volume method for convection-diffusion problems; (6) Solution algorithms for pressure-velocity coupling in steady flows; (7) Solution of discretized equations; (8)The finite volume method for unsteady flows (9) Implementation of boundary conditions; (10) Discussion of advances and cases.

Prerequisites: Fluid Mechanics, Heat Transfer, Advanced Mathematics, Linear Algebra, etc.

3. 室内环境质量（Indoor Environmental Quality）（credit 3）

Course Description: This course is designed for the graduate students majored in Heating Ventilation and Air-conditioning and/or Energy and power Engineering. The main contents of this course include: (1) Categories of indoor environments; (2) Indoor thermal environment parameters and indoor air quality; (3) Indoor and outdoor pollutant sources and the transport mechanism; (4) Measurement and control of pollutant dispersion in indoor and outdoor environments; (5) Building ventilation and CFD simulations; (6) Indoor environment quality and building energy saving; (7) Indoor environment quality and thermal comfort; (8) Indoor environment control principles and applications.

Prerequisites: Fluid Mechanics, Heats Transfer, Built Environment, Building Ventilation and Air conditioning, etc.

4. 智慧建筑与数据驱动建模（Smart buildings and data-driven modelling）（credit 3）

Course Description: This course is designed for the graduate students majored in Heating Ventilation and Air-conditioning and/or Energy and power Engineering. The main contents of this course include: (1) Introduction to Smart buildings; (2) Building automation system; (3) LAN principles and communication standards; (4) Application of Internet of Things technology in smart buildings; (5) Intelligent system control and operation optimization; (6) Data calculation methods for

data-driven models; (7) Solution and programming of data-driven models; (8) Visualization of the results from data-driven models; (9) Application of data-driven modeling in smart buildings; (10) Big data modeling in cloud computing and edge computing; and (11) Discussion of state-of-the-art investigation and research cases.
Prerequisites: Building Automation and Control, Computer Programming, Fluid Mechanics, Heat Transfer, Advanced Mathematics, etc.

5. 智慧能源系统（Smart energy system）（credit 3）

Course Description: This course is designed for the graduate students majoring in Heating Ventilation and Air-conditioning and/or Energy and power Engineering. The main contents of this course include: (1) Introduction; (2) Building energy consumption (3) BIPV technology; (4) Smart building; (5) Renewable energy system; (6) Energy storagy; (7) Distributed energy system; (8) Energy system optimization.
Prerequisites: Flud Mechanics, Heat Transfer, Thermodynamics etc.

6. 湿空气学（Moist thermodynamics）（credit 3）

Course Description: This course is designed for the graduate students majored in Heating Ventilation and Air-conditioning and/or Environmental Engineering (Atmospheric Engineering). The main contents include: (1) Introduction to moist air; (2) Thermodynamics of moist air (3) Condensation and evaporation; (4) The moist adiabat; (5) Droplet growth by condensation; (6) From cloud droplets to precipitation in a moist atmosphere (7) Indoor dehumidification techniques; (8) Discussion of advances and cases.
Prerequisites: Heat Transfer, Thermodynamics, Advanced Mathematics, etc.

7. 气体污染物控制技术（Air Pollution Control Technology）（credit 2）

Course Description: This course is designed for the graduate students majored in Heating Ventilation and Air-conditioning and/or Energy and Power Engineering. The main contents of this course include: Energy and Environment; Atmospheric diffusion of pollutants; Emission and control technologies of pollutants like NOx, CO_2, POPs (persistant organic pollutants), heavy metals, and VOC (volatile organic compounds).
Prerequisites: Boiler Principle, Combustion theory, Chemistry, Heat transfer, Engineering Thermodynamics, etc.

8. 流态化工程（Fluidization Engineering）（credit 3）

Course Description: This course is designed for the graduate students majored in Heating Ventilation and Air-conditioning and/or Energy and power Engineering. The main contents of this course include: (1) Introduction to Fluidization; (2) Industrial Applications of Fluidized Beds (3) Fluidization Regimes; (4) Dense Bed; (5) Bubbles in Dense Beds; (6) Bubbling Fluidized Beds; (7) Entrainment and Elutriation from Fluidized Beds; (8) High-Velocity Fluidization; (9) Solid Movement; (10) Gas Dispersion and Gas Interchange in Bubbling Beds; (11) Particle-to-Gas Mass and Heat Transfer.
Prerequisites: Fluid Mechanics, Heat Transfer, Advanced Mathematics etc.

9. 室内环境健康与建筑节能（Healthy Indoor Environment and Building Energy Efficiency）（credit 3）

Course Description: This course is designed for the graduate students majored in Heating Ventilation and Air-conditioning and/or Energy and power Engineering. The main contents of this course include: (1) Introduction; (2) Building systems; (3) Human responses; (4) Indoor pollutants; (5) Assessing IAQ; (6) Preventing indoor environmental problems; (7) Special indoor environments; (8) Residential Indoor Air Quality and Energy Efficiency.
Prerequisites: Fluid Mechanics, Heat Transfer, etc.

10. 建筑环境火用分析（Exergy Analysis for Built Environment）（credit 3）

Course Description: This course is designed for the graduate students majored in Heating Ventilation and Air-conditioning and/or Energy and power Engineering. Exergy analysis for built environment is the main element of this course. The evaluation method of energy consumption in built environment is necessary for energy management. Energy efficiency can be engaged to

evaluate the energy consumption in energy quantity level. However, for deep research, energy efficiency is not enough. Exergy is the parameter to evaluate the energy quality and the exergy analysis can help to gauge the overall energy economy of built environment. With exergy analysis, the thermodynamic irreversibility loss in built environment can be calculated using the second-law analysis. And exergy analysis can indicate the ways to improve energy efficiency. To learn this course, students should have the fundamental knowledge of thermodynamics, heat transfer, and built environment. In this course, students will learn the fundamental theory of exergy, built environment and exergy analysis application in built environment. To achieve credit of this course, students should master the exergy analysis theory and methods, and finish an energy analysis for a built environment system.

Requirements for Thesis Work and Publication of Academic Results

It usually takes one year or more to complete a thesis. Before conducting research on the thesis, the first step is to start the thesis proposal. The thesis proposal should be submitted in the third semester, usually before the end of November, and give an oral presentation. The thesis proposal should include the research background of the topic, the problems to be solved, the research plan, and the expected research progress, and be accompanied by a comprehensive review on the topic. The research work on the thesis topic could only begin after the approve of thesis proposal by a committee of at least 3 experts. Usually a concealed evaluation on the thesis is imposed to all the students or randomly selected students before the final oral defense of their thesis. So there usually is a pre-defense of the thesis in the 6^{th} semester, usually before March, organized by the supervisor. Necessary revision must be completed for the thesis draft. The final oral defense usually take place in May in the 6^{th} semester.

Before the defense of the thesis, at least one non-review paper related to the content of the thesis must be published or accepted in an officially published academic journal under the name of Donghua University and as the first or second author (the first author must be a master's supervisor). For other requirements, please refer to the "Regulations on Publishing Academic Papers during the Study Period of Graduate Students in the School of Environmental Science and Engineering".

4、SUPERVISOR INFORMATION

Prof Dr Yaxin Su (Ph D's supervisor)

Research Area: 1) advanced combustion and pollutant emission control; 2) thermo-chemical conversion of solid fuels; 3) CO_2 capture and utilization; 4) modeling and simulation of heat transfer and flow process.

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Dr Su is a professor in the School of Environmental Science and Engineering, Donghua University, China. He received his Ph D of Power Engineering and Engineering Thermophysics with a focus on combustion from Zhejiang University, China, in 2000. He worked in the Department of Chemical Engineering, University of Mississippi, USA as a visiting professor during 2006-2007.

Dr Su has been involved in heat transfer, gas-solid suspension flow and separation, building environment and energy conservation, solar energy thermal conversion, thermo-chemical conversion of solid fuels and pollutant emission control, selective catalytic reduction of NOx and new catalysts, CO_2 capture, etc. He has published 3 academic books and 5 textbooks in Chinese and 1 academic book chapter in English, more than 250 journal articles and 50 international conference papers.

Dr Su has won the ***Shanghai Municipal Outstanding Young University Professor*** in 2008, ***Shanghai Natural Science Award*** in 2016. He was included in the ***World Top 2% Scientists*** issued by Stanford University in 2021(single year list) and 2022 (single year and career long lists).

Selected recent publications:

1. Zhufeng Wang, Jiawei Huang, Bingbing Luo, Shuying Ning, Wenyi Deng, Bingtao Zhao, Songmei Sun, **Yaxin Su***. Selective catalytic reduction of NO by CO over MOF-based CuOx@ZIF-67 catalysts and reaction mechanism. **Fuel**, 2023, 348: 128565, https://doi.org/10.1016/j.fuel.2023.128565
2. Nini Wen，**Yaxin Su***，Wenyi Deng，Hao Zhou，Mingtao Hu, Bingtao Zhao. Synergy of CuNiFe-LDH based catalysts for enhancing low-temperature SCR-C3H6 performance: surface properties and reaction mechanism. **Chemical Engineering Journal,** 2022, 438:135570, https://doi.org/10.1016/j.cej.2022.135570
3. Nini Wen, **Yaxin Su***, Wenyi Deng, Hao Zhou, Bingtao Zhao. Selective catalytic reduction of NO with C_3H_6 over CuFe-containing catalysts derived from layered double hydroxides. **Fuel**, 2021, 283: 119296, https://doi.org/10.1016/j.fuel.2020.119296
4. **Yaxin Su*,** Nini Wen, Jianghao Cheng, Wenyi Deng, Hao Zhou, Bingtao Zhao. Experimental study on the SCR-C_3H_6 over Cu-Fe/Al-PILC catalysts: Catalytic performance, characterization and the mechanism. **Industrial & Engineering Chemistry Research**, 2020, 59(33):14776-14788, https://dx.doi.org/10.1021/acs.iecr.0c02798
5. Minhao Yuan, **Yaxin Su***, Wenyi Deng, Hao Zhou. Porous clay heterostructures (PCHs) modified with copper ferrite spinel as catalyst for SCR of NO with C_3H_6. **Chemical Engineering Journal**, 2019, 375:1222091, https://doi.org/ 10.1016/j.cej.2019.122091, featured article in Advances in Engineering(https://advanceseng.com/), Citation link: https://advanceseng.com/porous-clay-heterostructures-modified-copper-ferrite-spinel-catalyst-scr-no-c3h6/
6. Jin Sun, Bingtao Zhao*, **Yaxin Su***. Advanced control of NO emission from algal biomass combustion using loaded iron-based additives. **Energy**, 2019,185:229-238, https://doi.org/10.1016/j.energy.2019.07.042
7. Minhao Yuan, Wenyi Deng, Shilin Dong, Qiancheng Li, Bingtao Zhao, **Yaxin Su***. Montmorillonite based porous clay heterostructures modified with Fe as catalysts for selective catalytic reduction of NO with propylene. **Chemical Engineering Journal**, 2018, 353: 839-848, https://doi.org/10.1016/j.cej.2018.07.201
8. Hao Zhou *, MengYao Ge, Shiguo Wu, Bichao Ye, **Yaxin Su***. Iron based monolithic catalysts supported on Al_2O_3, SiO_2, and TiO_2: A comparison for NO reduction with propane. **Fuel**, 2018, 220:330-338, https://doi.org/10.1016/j.fuel. 2018.01.077
9. Hao Zhou, Kangkai Li, Bingtao Zhao, Wenyi Deng, **Yaxin Su***, Fangchuan Zhong. Surface properties and reactivity of Fe/Al_2O_3/cordierite catalysts for NO reduction by C_2H_6: effects of calcination temperature. **Chemical Engineering Journal**, 2017, 326: 737-744, **DOI:** 10.1016/j.cej.2017.06.018
10. Hao Zhou, **Yaxin Su***, Wenyu Liao, Wenyi Deng, Fangchuan Zhong. NO reduction by propane over monolithic cordierite-based Fe/Al_2O_3 catalyst: reaction mechanism and effect of H_2O and SO_2. **Fuel,** 2016, 182: 352-360, DOI:10.1016/j.fuel.2016.05.116

Prof Dr Yongfa Diao (Ph D's supervisor)

Research Area: 1) energy saving for ventilation and air conditioning in industrial and civil buildings; 2) efficient and clean utilization of energy and energy-saving conversion; 3) greenhouse gas abatement and utilization; 4) numerical prediction of flow and heat transfer processes and engineering applications.

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Dr. Diao is a professor in the School of Environmental Science and Engineering at Donghua University. He obtained his Ph.D. degree from Xi'an Jiaotong University in 2001 and served as a post-doctoral researcher in the Department of Thermal Power Machinery and Engineering at Tsinghua University in 2004. In 2008-2009, he worked as a visiting researcher at the Korea Institute of Energy Research. He is a member of the International Renewable Energy Society and the Ministry of Science and Technology, as well as being listed in the Shanghai expert's database. Dr. Diao has supervised over 60 postgraduate students and was honored as an Excellent Technology Leader in Shanghai in 2014. He has published more than 100 papers and has filed over 30 patent applications.

Selected recent publications:

1. Zhuang Jiawei, Liu Jianlin, Chen Gengyang, Hankun, Jiang Jie, Dongdong Tian, **Diao Yongfa***, Shen Henggen. A numerical study for predicting the maximum horizontal distance of particles' dispersion during transient welding processes[J]. **Journal of Building Engineering**, 2023, 71: 106449, https://doi.org/10.1016/j.jobe.2023.106449
2. Dai Jia-ao，**Diao Yongfa***，Numerical analysis of transient coupled heat and moisture transfer in textile drying with porous relative impact jet[J].**Applied Thermal Engineering**, 2022, 212(118613), https://doi.org/10.1016/j.applthermaleng.2022.118613
3. Zhang Li'an, **Diao Yongfa***, Chu Minghao, Jiang Jie, Shen Henggen. The influence of interaction between orthogonal magnetic fibers on the capture of Fe-based fine particles by each fiber[J]. **Journal of Engineered Fibers and Fabrics**, 2022, 17: 15589250221093030, https://doi.org/10.1177/15589250221093030
4. Zhang Li'an, **Diao Yongfa***, Chu Minghao, Zhou Fashan, Li Zihang, Shen Henggen. Study on external magnetic field improving the capture of Fe-based fine particles by magnetic fibers with different arrangement structures[J]. **Particulate Science and Technology**, 2022, 40(6): 675-685, https://doi.org/10.1080/02726351.2021.1992058
5. Zhang Li'an, **Diao Yongfa***, Jiang Jie, Chu Minghao, Han Kun, Shen Henggen. Study on turbulent aggregation dynamics in the process of fine particles capture by single fibers[J]. **Particulate Science and Technology**, 2022: 1-9, https://doi.org/10.1080/02726351.2022.2068463
6. Zhuang Jiawei, **Diao Yongfa***, Shen Henggen. Numerical investigation on transport characteristics of high-temperature fine particles generated in a transiently welding process[J]. International **Journal of Heat and Mass Transfer**, 2021,176: 121471, https://doi.org/10.1016/j.ijheatmasstransfer.2021.121471
7. Zhou Fashan, **Diao Yongfa***. Magnetic copper-ferrosilicon composites as regenerable sorbents for Hg0 removal[J]. **Colloids and Surfaces A: Physicochemical and Engineering Aspects**, 2020, 590: 124447, https://doi.org/10.1016/j.colsurfa.2020.124447
8. Chen Chen, **Diao Yongfa***, Lu Yao, Chen Shanshan, Tian Li. Complete Reaction Mechanisms of Mercury Binding on Petroleum Coke and Brominated Petroleum Coke[J], **Energy & Fuels**, 2019, 33, 5488-5497, https://doi.org/10.1021/acs.energyfuels.9b00768

9. Xiao Yi, Pudasainee Deepak, Gupta Rajender, Xu Zhenghe, **Diao Yongfa***. Bromination of petroleum coke for elemental mercury capture[J]. **Journal of hazardous materials**, 2017, 336: 232-239, https://doi.org/10.1016/j.jhazmat.2017.04.040
10. Xiao Yi, Pudasainee Deepak, Gupta Rajender, Xu Zhenghe, **Diao Yongfa***. Elemental mercury reaction chemistry on brominated petroleum cokes[J]. **Carbon**, 2017, 124: 89-96. https://doi.org/10.1016/j.carbon.2017.08.031

Prof. Dr. Honghai Yang (Master's supervisor)
Research Area: 1) Heat and mass transfer; 2) Solar energy thermal conversion; 3) Energy saving and new technology in HVAC system.
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Dr. Yang is a professor in the School of Environmental Science and Engineering at Donghua University in China. She received her PhD degree from the College of Mechanical Engineering at Donghua University in Shanghai in 2006. During her studies, she also spent time at the University of Stuttgart in Germany from June 2003 to August 2005.

Dr. Yang's research primarily focuses on energy conversion and management, heat and mass transfer, and energy-saving technologies in HVAC systems. She has particular expertise in the areas of heat pipes, bubble pumps, and solar energy thermal conversion. Throughout her career, she has published over 100 articles in Chinese journals, approximately 30 articles in international journals, and has filed 8 patents. Additionally, she has authored a textbook in Chinese.

Selected recent publications:

1. **Honghai Yang***, Yuping Chen, Yiwei Wu, et al., Thermo-fluidic characteristics and performance in a distribute heating bubble pump generator, **Int J. Refrigeration**, 2022, 133(1):181-190.
2. Yi Zhou, **Honghai Yang***, Liwei Liu, et al., Enhancement of start-up and thermal performance in pulsating heat pipe with GO/water nanofluid, **Powder Technology**, 2021, 384(2): 414–422.
3. Yuwen Si, Hongqiang Wang, Yujia Wang, **Honghai Yang***, et al., Effects of single-layer low clouds on the surface solar radiation in East Asia, **Solar Energy**, 2021, 224:1099–1106.
4. **Honghai Yang***, Jun Wang, Ning Wang, Fengchang Yang, Experimental study on a pulsating heat pipe heat exchanger for energy saving in air-conditioning system in summer, **Energy and Buildings**, 2019,197(15): 1-6
5. Ning Zhang, Shao-you Yin, **Honghai Yang***, Transient performance of coupled heat and mass transfer in cross-flow hollow fiber membrane module for air dehumidification, **Int J. Refrigeration**, 2019, 108:190-199.

Prof. Dr. Jianlin Liu (PhD's supervisor)
Research Area: 1) Industrial building ventilation and air cleaning; 2) urban microclimate and low-carbon community design; 3) Human behavior and thermal comfort.
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Dr. Liu is a Professor in the School of Environmental Science and Engineering, Donghua University. He received his PhD from Hong Kong Polytechnic University (PolyU) in

2017. Prior to the current positions, he was the Postdoctoral Research Associate in the University of Sydney and the Research Fellow in the PolyU, respectively.

Dr. Liu's primary research areas involve urban microclimate, industrial building ventilation and air cleaning, and human thermal comfort. He is the Board Members for the Building Ventilation Group of China and IBPSA-China. He serves as the Associate Editor of the international journal *Architectural Intelligence*, Editor of the international journal *Building Simulation*, and the Editorial Board Member of the international journal *Building and Environment*.

Selected recent publications:

1. Hu, R., **Liu, J.** *, Xie, Y., Jiao, J., Fang, Z., & Lin, B. (2023). Effects of mask wearing duration and relative humidity on thermal perception in the summer outdoor built environment. ***Building Simulation***, *16*(9), 1601-1616. doi:10.1007/s12273-022-0978-9
2. Zhong, J., **Liu, J.***, Xu, Y., & Liang, G. (2022). Pedestrian-level gust wind flow and comfort around a building array–Influencing assessment on the pocket park. ***Sustainable Cities and Society***, *83*, 103953. doi: https://doi.org/10.1016/j.scs.2022.103953
3. **Liu, J.,** Jiao, J., Xie, Y*., Xu, Y., & Lin, B. (2022). Assessment on the expectation for outdoor usage and its influencing factors. ***Urban Climate***, *42*, 101132. doi:https://doi.org/10.1016/j.uclim.2022.101132
4. **Liu, J.**, Niu, J*., Du, Y., Mak, C. M., & Zhang, Y. (2019). LES for pedestrian level wind around an idealized building array – assessment of sensitivity to influencing parameters. ***Sustainable Cities and Society***, *44*, 406-415. doi:https://doi.org/10.1016/j.scs.2018.10.034
5. **Liu, J.**, & Niu, J.* (2016). CFD simulation of the wind environment around an isolated high-rise building: An evaluation of SRANS, LES and DES models. ***Building and Environment***, *96*, 91-106. doi:http://dx.doi.org/10.1016/j.buildenv.2015.11.007

Dr. Wenyi Deng (Master's Supervisor)

Research Area: 1) Microwave-assisted thermo-chemical conversion of solid fuels; 2) Control of gaseous pollutants; 3) Electro-dewatering and drying technology.

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Dr. Deng is an associate professor in the School of Environmental Science and Engineering, Donghua University. He received his PhD of Power Engineering and Engineering Thermophysics with a focus on solid waste combustion from Zhejiang University in 2009. He worked in the Department of Bioproducts and Biosystems Engineering, University of Minnesota, USA as a visiting scholar during 2019-2020.

Dr Deng has been involved in microwave-assisted thermo-chemical conversion of solid fuels, such as drying, microwave-assisted pyrolysis and gasification of waste sludge and biomass, pollutants emissions control, such as NOx reduction and low temperature oxidation, and electro-dewatering of wet materials like sewage sludge. He has published more than 80 journal articles and 20 international conference papers.

Selected recent publications (*corresponding author):

[1] Mingtao Hu, **Wenyi Deng***, Yaxin Su, et al. Production of hydrogen-rich syngas through microwave-assisted gasification of sewage sludge in steam-CO2 atmosphere. **Fuel** 2024, 357, 129855.

[2] **Wenyi Deng***, Mingtao Hu, Yaxin Su, et al. Pyrolysis of sludge briquettes for the preparation of cylindrical-shaped biochar and comparison between CO2 and steam activation. **Fuel** 2023, 338, 127317.
[3] Hu Mingtao, **Deng Wenyi***, Su Yaxin, et al. Optimization of hydrogen sulfide adsorption performance by tar based porous carbon prepared by template method. **Sep. Purif. Technol.** 2023, 327, 124979.
[4] **Wenyi Deng***, Jie Zhou, Li Yu, et al. Application of boundary electro-osmotic pulse to reduce sludge-to-wall adhesion. **Water Res**. 2021, 195: 116982.
[5] **Wenyi Deng***, Minhao Yuan, Jing Mei, et al. Effect of calcium oxide (CaO) and sawdust on adhesion and cohesion characteristics of sewage sludge under agitated and non-agitated drying conditions. **Water Res**. 2017, 110: 150-160.
[6] **Wenyi Deng***, Zhicheng Lai, Menghao Hu, et al. Effects of frequency and duty cycle of pulsating direct current on the electro-dewatering performance of sewage sludge. **Chemosphere** 2020, 243: 125372.
[7] **Wenyi Deng***, Menghao Hu, Jingchen Ma, et al. Structural and functional relationships of activated char briquettes from pyrolysis of sewage sludge for methylene blue removal **J. Clean. Prod.** 2020, 259: 120907.
[8] **Wenyi Deng***, Cong Tao, Cobb Kirk, et al. Catalytic oxidation of NO at ambient temperature over the chars from pyrolysis of sewage sludge. **Chemosphere** 2020, 251: 126429.
[9] **Wenyi Deng***, Jingchen Ma, Jiamin Xiao, et al. Orthogonal experimental study on hydrothermal treatment of municipal sewage sludge for mechanical dewatering followed by thermal drying. **J. Clean. Prod.** 2019, 209: 236-249.
[10] **Wenyi Deng***, Shugang Liu, Jingchen Ma, et al. Microwave-assisted ethanol decomposition over pyrolysis residue of sewage sludge for hydrogen-rich gas production. **Int. J. Hydorgen Energy** 2018, 43: 15762-15772.

Dr. Zi-Li YANG (Master's supervisor)
Research area: 1) indoor thermal and humid environment; 2) solar-driven dehumidification system; 3) modelling of indoor environment.
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Dr. Yang is an associate professor in the School of Environmental Science and Engineering, Donghua University. He received his Ph.D. of Civil Engineering (HVAC) from Shanghai Jiao Tong University in 2017. He worked as a Research Assistant Professor in the Department of Building Environment and Energy Engineering, the Hong Kong Polytechnic University in 2022. He also worked as a visiting scholar at CEEE, University of Maryland, USA , from 2016 to 2017.

Dr. Yang has been involved in the research on indoor air quality and building energy efficiency, especially the solar-driven dehumidification systems, modeling indoor thermal and humid environments, and addressing mold pollution in indoor and HVAC systems. He has published over 40 journal articles and international conference papers.

Dr. Yang has received recognition for his mentorship skills, being awarded the Outstanding Undergraduate Mentor in 2020 and the Outstanding Master Thesis Supervisor in 2020 by Donghua University.

Selected recent publications:

1. **Zili Yang***, Weiyi Zhang, Xi Lin, Qian Xiong, Qingwen Jiang. Optimization of minor-LiCl-modified gypsum as an effective indoor moisture buffering material for sensitive and long-term humidity contro l. ***Building and Environment***. 2023, https://doi.org/10.1016/j.buildenv.2022.109962
2. **Zili Yang**, Lu-An Chen, Chuanjun Yang, Yuqian Gu, Rong Cao, Ke Zhong*. Portable ultrasonic humidifier exacerbates indoor bioaerosol risks by raising bacterial concentrations and fueling pathogenic genera. ***Indoor Air***. 2022, https://doi.org/10.1111/ina.12964
3. Yuqian Gu, Ke Zhong, Rong Cao, **Zili Yang***. Aqueous lithium chloride solution as a non-toxic bactericidal and fungicidal disinfectant for air-conditioning systems: efficacy and mechanism. ***Environmental Research***. 2022. https://doi.org/10.1016/j.envres.2022.113112
4. Yihang Lu, **Zili Yang**, Jia Yu, Ke Zhong*. Development of a second-order dynamic model for quantifying impact of thermal mass on indoor thermal environment. ***Journal of Building Engineering***, 2021. https://doi.org/10.1016/j.jobe.2021.102496
5. **Zili Yang**, Ruiyang Tao, Lu-An Chen, Ke Zhong*, Bin Chen, Feasibility study on improving the performance of atomization liquid desiccant dehumidifier with standing-wave ultrasound, ***Energy***, 2020. https://doi.org/10.1016/j.energy.2020.118101
6. **Zili Yang**, Ruiyang Tao, Hui Ni, Ke Zhong*, Zhiwei Lian, Performance study of the internally-cooled ultrasonic atomization liquid desiccant dehumidification system, ***Energy***, 2019. https://doi.org/10.1016/j.energy.2019.03.114
7. **Zili Yang**, Zhiwei Lian, Ruiyang Tao, Hui Ni, Ke Zhong*, Experimental study on the performance of the internally-heated ultrasonic atomization liquid desiccant regeneration system, ***Applied Thermal En gineering***, 2019. https://doi.org/10.1016/j.applthermaleng.2019.114211
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9. **Zili Yang**, Zhiwei Lian*, Yuhui An, Anyang Chen, Jing Xiong, Zhixin Miao, Feasibility study on applying the mist evaporation cooling for capacity improvement of ultra-large container ships for loading reefers, ***Ocean Engineering***, 2018. https://doi.org/10.1016/j.oceaneng.2018.06.009
10. **Zili Yang**, Kaisheng Zhang, Yunho Hwang, Zhiwei Lian*, Performance investigation on the ultrasonic atomization liquid desiccant regeneration system, ***Applied Energy***, 2016. https://doi.org/10.1016/j.apenergy.2016.03.008

Dr Yu Li (Master's supervisor)

Research Area: 1) Data-driven building energy prediction; 2) building energy simulation and optimization; 3) district energy system optimization.

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Dr Li is an associate professor in the School of Environmental Science and Engineering, Donghua University. She received her PhD from Cardiff University, UK, in 2018. She worked as a Postdoc for two years in Luxembourg Institute of Science and Technology before she joined Donghua University.

Dr. Li has been involved in building energy, district energy, machine learning and intelligent optimization. She has published more than 10 journal articles.

Selected recent publications:

1. X. Zhu, P. Gui, X. Zhang, Z. Han, **Y. Li***, Multi-objective optimization of a hybrid energy system integrated with solar-wind-PEMFC and energy storage. **J. Energy Storage**, vol. 72, p. 108562, Nov. 2023, doi: 10.1016/j.est.2023.108562
2. X. Zhu, X. Zhang, P. Gong, **Y. Li***, A review of distributed energy system optimization for building decarbonization. **J. Build. Eng.,** vol. 73, p. 106735, Aug. 2023, doi: 10.1016/j.jobe.2023.106735
3. **Y. Li**, Y. Rezgui, A. Guerriero, et al. Development of an adaptation table to enhance the accuracy of the Predicted Mean Vote model. 168 (2020) 106504. **Build. Environ**. doi.org/10.1016/j.buildenv.2019.106504
4. **Y. Li**, Y. Rezgui, S. Kubicki, An intelligent semantic system for real-time demand response management of a thermal grid, **Sustain. Cities Soc**. 52 (2020) 101857. doi:10.1016/J.SCS.2019.101857
5. **Y. Li**, S. Kubicki, A. Guerriero, Y. Rezgui, Review of building energy performance certification schemes towards future improvement, **Renew. Sustain. Energy Rev.** 113 (2019) 109244. doi:10.1016/J.RSER.2019.109244
6. **Y. Li**, Y. Rezgui, A novel concept to measure envelope thermal transmittance and air infiltration using a combined simulation and experimental approach, **Energy Build.** 140 (2017) 380–387. doi:10.1016/j.enbuild.2017.02.036
7. **Y. Li**, Y. Rezgui, H. Zhu, District heating and cooling optimization and enhancement – Towards integration of renewables, storage and smart grid, **Renew. Sustain. Energy Rev.** 72 (2017) 281–294. doi:10.1016/j.rser.2017.01.061

Dr. Xin Xiao (Master's supervisor)

Research Area: 1) Latent thermal energy storage and thermal management; 2) Dew point evaporation and new type of air-conditioning; 3) Carbon capture with carbon hydrate.

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Dr. Xiao is an associate professor in the School of Environmental Science and Engineering, Donghua University. He received his PhD from Shanghai Jiao Tong University in 2015 and awarded the JSPS fellowship. He worked in University of Leeds as a research fellow supported by the **Marie Curie fellowship** in 2017~2019 and in University of Hull as a senior research fellow in 2019~2020, respectively. He was awarded **Shanghai 'Pujiang' Talent** in 2020 and **Shanghai 'Overseas High-level' Talent** in 2021, respectively.

Dr. Xiao has been involved in the research on energy storage, heat and mass transfer, low carbon technology, etc. He has published more than 100 papers, including more than 50 papers with SCI/EI index, with a total of more than 3000 citations.

He has won the **Natural Science Award of Yunnan Province (First level)**, the Joint Third Prize of Excellence in Chemical Research of Society of Chemical Science & Technology in the UK, together with **IChemE & CCST Young Investigator Award** and T-C Innovation Award of UTC-Carrier. He was list in the **World Top 2% Scientists** issued by Stanford University in 2023 (single year list).

Selected publications:

1. **Xiao X***, Liu JJ. Review of dew point indirect evaporative cooling technology and integrated applications. **Renewable and Sustainable Energy Reviews**, 2023.
2. Liu JJ, **Xiao X*.** Molecular dynamics investigation of thermo-physical properties of molten salt with nanoparticles for solar energy application. **Energy**, 2023, 282: 128732.
3. Hu Q, **Xiao X***. Formation methods and applications of carbon dioxide hydrate: an overview. **Carbon Capture Science and Technology**, 2023, 7: 100113.
4. Chen Q; **Xiao X***; Shou DH; Chen HX; Zheng W; Fu BL; Zheng R; Fan JT. Directional water transport property of cotton-polyester knitted plating fabric with multiple gradient concentration coating. **Fibers and Polymers**, 2023, 24: 2933-2939.
5. **Xiao X***, Feng Z, Jia HW, Wang Y F, Chen Q*, Lv FY*. Research progress of thermal-regulating textiles based on spinning of organic phase change energy storage fiber. **Textile Research Journal**, 2023.
6. **Xiao X***, Hu Q, Jiao HS, Wang YF, Badiei A*. Simulation and machine learning investigation on thermoregulation performance of phase change wall. **Sustainability**, 2023, 15: 11365.
7. Feng Z, **Xiao X***. Thermal conductivity measurement of flexible composite phase-change materials based on the steady-state method. **Micromachines**, 2022, 13, 1582.
8. Lv FY, Zhao F, Cheng DL, Dong ZG, Jia HW, **Xiao X***, Orejon D*. Bioinspired functional SLIPS and wettability gradient surfaces and their synergistic cooperation and opportunities for enhanced condensate and fluid transport. **Advances in Colloid and Interface Science**, 2022, 299: 102564.
9. **Xiao X*,** Jia HW, Pervaiz S, Wen DS*. Molten salt/Metal foam/Graphene nanoparticle phase change composites for thermal energy storage. **ACS Applied Nano Materials**, 2020, 3: 5240-5251.
10. **Xiao X*,** Jia HW, Wen DS, Zhao XD. Thermal performance analysis of a solar energy storage unit encapsulated with HITEC salt/copper foam/nanoparticles composite. **Energy**, 2020, 192: 116593.

Dr. Xuebin Yang (Master's supervisor)

Research Area: 1) Building diagnostic and decision support system for energy efficient operation and cost effective services; 2) Intelligent strategies of fault diagnostics and predictive health management in air conditioning systems; 3) Fluid dynamic characteristics of ejectors used in hydrogen-oxygen fuel cells; and 4) Indoor microclimate and pollutant control.

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Dr. Yang is an associate professor in the School of Environmental Science and Engineering, Donghua University, China. He received his Ph.D. of Power Engineering and Engineering Thermophysics with a focus on time-variant simulation and fault diagnosis of building air conditioning systems from Shanghai Jiao Tong University, China, in 2012. He has worked as a Postdoctoral research fellow in the Department of Civil, Architectural and Environmental Engineering in Drexel University, USA from 2013 to 2014.

Dr. Yang has been involved in the fields of building service, built environment, and green low-carbon energy equipment, and mainly focused on fluid flow, heat and mass transfer, energy efficiency, etc. He has published more than 80 journal articles and 10 international conference papers.

Selected recent publications:

1. **YANG Xuebin***, CHEN Jianfei, GU Xuan, et al. Sensitivity analysis of scalable data on three PCA related fault detection methods considering data window and thermal load matching strategies. **Expert Systems with Applications**, 2023, 234：121024, https://doi.org/10.1016/j.eswa.2023.121024.
2. **YANG Xuebin***, HE Ruru, WANG Ji, et al. Using thermal load matching strategy to locate historical benchmark data for moving-window PCA based fault detection in air handling units. **Sustainable Energy Technologies and Assessments,** 2022, 52：102238, https://doi.org/10.1016/j.seta.2022.102238.
3. **YANG Xuebin***, LI Xinhai, YANG Siyu, et al. Online fault detection configuration on equipment side of a variable-air-volume air handling unit. **Journal of Donghua University** (English Edition), 2023, 40 (02): 225-231. https://doi.org/10.19884/j.1672-5220.202111010.
4. **YANG Xuebin***, MA Yanyun, HE Ruru, et al. Influence of three sizes of sliding windows on principle component analysis fault detection of air conditioning systems. **Journal of Donghua University** (English Edition), 2022, 39 (01): 72-78. https://doi.org/10.19884/j.1672-5220.202103002.
5. ZHANG Denghao, **YANG Xuebin*** AND DU Zhongxuan, "Three-dimensional hybrid mesh generation method for the ejector used in proton exchange membrane fuel cells," **2021 IEEE Asia-Pacific Conference on Computer Science and Data Engineering (CSDE)**, 2021, pp. 1-5, https://doi.org/10.1109/CSDE53843.
6. ZHAO Yang, WEN Jin, XIAO Fu, **YANG Xuebin**, et al. Diagnostic Bayesian networks for diagnosing air handling units faults – part I: Faults in dampers, fans, filters and sensors. **Applied Thermal Engineering**, 2017, 111：1272-1286, https://doi.org/10.1016/j.applthermaleng.2015.09.121.
7. WEN Jin, POURARIAN Shokouh, **YANG Xuebin**, et al. (Ed.). **NIST 10D243 Final Report** -Tools for evaluating fault detection and diagnostic methods for HVAC secondary systems of a net zero building[R]. 2015.

Dr Jingde Zhao (Master's supervisor)

Research Area: 1) thermal comfort in buildings or vehicles; 2) heat transfer between human body and surrounding environment; 3) model of frost growing and defrosting; 4) energy conservation of model HVAC system.

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Dr Zhao is an associate professor in the School of Environmental Science and Engineering, Donghua University, China. He received his Ph D of Power Engineering and Engineering Thermophysics with a focus on radiative heat transfer in power plant boiler furnace from Zhejiang University, China, in 2004. He worked in the Department of Engineering Technology & Industrial Distribution，Texas A&M University, USA as a visiting professor during 2011-2012.

Dr Zhao has been involved in thermal comfort of human body in buildings or vehicles, heat transfer between human body and environment, model of frost growing and defrosting, energy conservation of model HVAC system, etc. He has published 1 academic book, more than 80 journal articles and 10 international conference papers.

Selected recent publications:

1. Jingjing Wu, Jianlin Liu*, **Jingde Zhao**, Yun Su. Influencing assessment of different heating modes on thermal comfort in electric vehicle cabin. **Energy and Built Environment**, Available online 19 April 2023,

https://doi.org/10.1016/j.enbenv.2023.04.005
2. Jingjing Wu and **Jingde Zhao***. The Thermal Comfort Characteristics of PCS Applied in EVs. Proceedings of the 2022 International Conference on Green Building, Civil Engineering and Smart City, 2022.04.08, Guilin, China
3. Hui Zhang, **Jingde Zhao***, Ji Fan, Chunhua Li. Experimental study on thermal comfort of military tent made of radiation refrigeration materials (in Chinese). **Journal of Thermal Science and Technology,** 2022, 21(03), DOI: 10.13738/j.issn.1671-8097.021242
4. **ZHAO Jingde***， DING Yiran， ZHANG Chunhong. Heat transfer modeling and experimental research of ventilation clothing in high-temperature outdoor environment (in Chinese). **Journal of Textile Research,** 2021, 42(6), DOI: 10. 13475 /j.fzxb.20201004407
5. **ZHAO Jingde***, Huang Hai, Zou Ying. Theoretical model of the laminar flow heat transfer through the MPCMs plate based on equivalent specific heat (in Chinese). **Journal of Thermal Science and Technology,** 2022, 21(03), DOI: 10.13738/j.issn.1671-8097.019083
6. Zou Ying, **ZHAO Jingde***, Huang Hai. Thermal Comfort of Personal Comfort System in Electric Vehicles (in Chinese). **Journal of Donghua University (Natural Science)**, 2020, 46(04),

Dr Yang He (Master supervisor)
Research Area: 1) Climate adaptable building skin technology; 2) Microclimate simulation and optimization of urban neighborhoods; 3) Integrated design of photovoltaic-greening.
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Dr He is an associate research fellow in the School of Environmental Science and Engineering, Donghua University, China. He received Ph D in Heating, Ventilation and Air-conditioning Engineering (HVAC) from Tongji University, China, in 2018. He worked in the Department of Building, National University of Singapore, as a postdoctoral researcher during 2019-2022.

Dr He has been involved in testing, simulation, evaluation and optimization of building envelope in terms of thermal performance and achieved many achievements in coupled heat and moisture transfer of planted building skin system and the microclimate effects of urban greenery. As a pivotal team member, he actively contributed to constructing Singapore's plant database and spearheaded the development of prediction tools for thermal performance indicators related to green roofing in tropical areas, as well as environmental control techniques for vertical farms. He has published over 20 papers and authored one personal monograph.

Selected recent publications:

1. **He Y***, Lin E S, Zhang W, et al. Local microclimate above shrub and grass in tropical city: A case study in Singapore. Urban Climate, 2022, 43: 101142.
2. **He Y***, Lin ES, Tan CL, Tan PY, Wong NH. Quantitative evaluation of plant evapotranspiration effect for green roof in tropical area: A case study in Singapore. Energy and Buildings. 2021, 241:110973.
3. **He Y***, Lin ES, Tan CL, Yu Z, Tan PY, Wong NH. Model development of Roof Thermal Transfer Value (RTTV) for green roof in tropical area: A case study in Singapore. Building and Environment. 2021, 203:108101.
4. **He Y***, Lin ES, Yu Z, Tan CL, Tan PY, Wong NH. The effect of dynamic albedos of plant canopy on thermal

performance of rooftop greenery: A case study in Singapore. Building and Environment. 2021, 205:108247.
5. **He Y***, Yu H, Ozaki A, Dong N. Thermal and energy performance of green roof and cool roof: A comparison study in Shanghai area. Journal of Cleaner Production. 2020, 267:122205.

Dr Yuchuan Lei (Master's supervisor)
Research Area: 1) Supercritical CO_2 convective heat transfer; 2) Flow condensation heat transfer.
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Dr Lei is an assistant professor in the School of Environmental Science and Engineering, Donghua University, China. She received her Ph. D of Heating, Ventilation and Air-conditioning Engineering with a focus on fluid heat transfer from Southeast University, China, in 2021. She worked as a visiting scholar in the Department of Mechanical Engineering, Purdue University, USA during 2018-2020.

Dr Lei was selected to the Shanghai Sailing Program in 2023, supported by the Shanghai Municipal Science and Technology Commission. She has published 12 journal articles and won the Outstanding Doctoral Dissertations in Southeast University in 2023.

Selected recent publications:

1. **Yuchuan Lei;** Hongwei Jia; Ke Zhong; Zhenqian Chen, Experimental study on turbulent convection heat transfer of supercritical CO_2 in cooled inclined miniature tubes, **International Journal of Refrigeration**, Vol. 152, PP. 129-145, 2023.
2. **Yuchuan Lei,** Bo Xu, Zhenqian Chen, Experimental investigation on cooling heat transfer and buoyancy effect of supercritical carbon dioxide in horizontal and vertical micro-channels, **International Journal of Heat and Mass Transfer**. Vol. 181, PP. 121792, 2021.
3. **Yuchuan Lei,** Issam, Mudawar, Zhenqian Chen, Computational and experimental investigation of condensation flow patterns and heat transfer in parallel rectangular micro-channels, **International Journal of Heat and Mass Transfer**, Vol. 149, PP. 119158, 2020.
4. V.S. Devahdhanush[1], **Yuchuan Lei[1]**, Zhenqian Chen, Issam, Mudawar, Assessing advantages and disadvantages of macro- and micro-channel flow boiling for high-heat-flux thermal management using computational and theoretical/empirical methods, **International Journal of Heat and Mass Transfer**. Vol. 167, PP. 120787, 2021.
5. **Yuchuan Lei,** Zhenqian Chen, Numerical study of condensation flow regimes in presence of non-condensable gas in minichannels, **International Communications in Heat and Mass Transfer**, Vol. 106, PP. 1-7, 2019.
6. **Yuchuan Lei,** Zhenqian Chen, Cooling heat transfer and pressure drop of supercritical CO2 in wavy microchannels with consistent and opposite crests and troughs, **International Journal of Refrigeration**, Vol. 109, PP. 64-81, 2020.
7. **Yuchuan Lei**, Zhenqian Chen, Numerical study on cooling heat transfer and pressure drop of supercritical CO2 in wavy microchannels, **International Journal of Refrigeration**, Vol. 90, PP. 46-57, 2018.
8. **Yuchuan Lei**, Zhenqian Chen, Analysis of condensation heat transfer in curved triangle microchannel under microgravity, **Chinese Journal of space science**, Vol. 38(3), PP. 368-372, 2018.

Dr Yongzhi Zhang (Master's supervisor)
Research Area: 1) Indoor air quality control; 2) Aircraft cabin thermal environment; 3) Building energy efficiency; 4) Aerosol dynamics.
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Dr Zhang is an assistant professor in the School of Environmental Science and Engineering, Donghua University, China. He received his Ph.D. degree of Heating, Ventilation and Air Conditioning Engineering from Tianjin University, China, in 2017.

Dr Zhang's research has been involved in indoor air quality control, building environment and energy conservation and Aerosol dynamics, etc. He has published more than 20 journal articles, 5 patents and taken part in 2 research projects as the chief investigator.

Selected recent publications:

[1] Ping Wang, **Yongzhi Zhang***, Bingqiang Yang, Jing Song, Jiaxing Zhang, Zihan Xing. Analysis of the influence of large-scale room circulation on the human microenvironment. **Energy & Buildings**, 2023.

[2] Zihan Xing, **Yongzhi Zhang***, Ping Wang, Jiaxing Zhang. Investigation of longitudinal airflow characteristics in an aircraft cabin based on angle of attack. **Indoor and Built Environment**, 2023.

[3] **Yongzhi Zhang***, Guo Zengrui, Lanting Zhuo, Yifei Han. Ventilation strategies for highly occupied public environments: A review. **Buildings**, 2023.

[4] Xuesong Hu, **Yongzhi Zhang***, Ying Gao, Yifei Han, Zengrui Guo. Study on the airflow and vortex distributions in a long narrow enclosed space. **Science and Technology for the Built Environment**, 2022:28.

[5] Yifei Han, **Yongzhi Zhang***, Ying Gao, Xuesong Hu, Zengrui Guo. Vortex structure of longitudinal scale flow in a 28-row aircraft cabin, **Building and Environment**, 2022, 222, 109362,

[6] **Yongzhi Zhang**, Jiayu Li, Junjie Liu*. Experimental study of the impact of passenger behavior on the aircraft cabin environment. **Science and Technology for the Built Environment**, 2020, 27(4).

[7] **Yongzhi Zhang**, Jiayu Li, Mingxin liu, Junjie Liu*. Experimental investigation of large-scale flow structures in an aircraft cabin mock-up. **Building and Environment**, 2020, 184:107224.

[8] You R, **Yongzhi Zhang**, Zhao X, et al. An innovative personalized displacement ventilation system for airliner cabins. **Building and Environment**, 2018, 137(6):41-50.

[9] **Yongzhi Zhang**, Junjie Liu, Jingjing Pei*, Congcong Wang. Statistical analysis of turbulent thermal convection in a cabin mockup. **Building and Environment**, 2017, 115: 34-41.

[10] **Yongzhi Zhang**, Junjie Liu, Jingjing Pei*, Jiayu Li, Congcong Wang. Performance evaluation of different air distribution systems in an aircraft cabin mockup. **Aerospace Science and Technology**, 2017, 70: 359-366.