

# Yimin Chen

Energy and Environmental Technology Researcher  
Building Technology and Urban System Division, Lawrence Berkeley National Laboratory  
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## **RESEARCH INTERESTS**

Development of data-driven and AI-based technologies for smart buildings and cities; resilient and sustainable buildings; building decarbonization; HVAC system optimal and fault-free control; HVAC system fault detection and diagnostics; building energy system control and operation; building to grid; IoT technologies and their applications in smart buildings, development of advanced building maintenance technologies

## **EDUCATION**

<b>Ph.D. Architectural Engineering</b>	<b>Drexel University, Philadelphia, PA U.S.</b> Thesis Topic: Data-driven Method based Whole Building Fault Detection and Diagnosis	05/2019
<b>M.S., Electrical Engineering</b>	<b>Beijing Jiaotong University, Beijing China</b> Thesis Topic: Research on MCCB Terminal Heating and Online Monitor System of Terminal Temperature Rise	07/2009
<b>B.Eng., Industrial Automation</b>	<b>Beijing University of Civil Engineering &amp; Architecture, Beijing China</b>	07/2002

## **PROFESSIONAL EXPERIENCE**

<b>Energy and Environmental Technology Researcher, Lawrence Berkeley National Laboratory</b>	03/2023-Present
<ul style="list-style-type: none"><li>• Lead the development, deployment and demonstration of the novel HVAC system FDD and correction tools</li><li>• Lead the development of the IAQ-embedded EMIS</li><li>• Lead the development and deployment of smart thermostat-based control system for HVAC system's operation enhancement</li><li>• Lead the development of innovative framework for integrating FDD data into the computer maintenance management system</li></ul>	
<b>Senior Scientific and Engineering Associate, Lawrence Berkeley National Laboratory</b>	03/2019-02/2023
<ul style="list-style-type: none"><li>• Led the development of the HVAC system fault taxonomy library</li><li>• Led the development of a fundamental approach and models for streamlining FDD data process and performing FDD data analytics</li><li>• Led the development of the cutting-edge Automated Commissioning (Auto-Cx) tool to improve the Auto-Cx and Retro-Cx processes, as well as to enhance fault root cause analytics</li><li>• Developed and curated the largest HVAC system fault data set in the world. Led the benchmark of the FDD methods on the fault data set. Led the</li></ul>	

<ul style="list-style-type: none"> <li>• construction of the fault data set website. Led the HVAC fault prioritization analytics</li> <li>• Led the investigation of HVAC system fault impacts</li> <li>• Developed development and deployment of innovative automated fault correction technologies</li> </ul>	
<b>Graduate Research Assistant/Teaching Assistant, Drexel University</b>	07/2015-02/2019
<ul style="list-style-type: none"> <li>• Developed data-driven services for high performance and sustainable buildings (sponsored by NSF)</li> <li>• Developed data-driven based methods for whole building system AFDD (sponsored by U.S. DOE)</li> <li>• Built a VOLTTRON compatible whole building system AFDD tool by using Python on the Linux environment (sponsored by PNNL and DOE)</li> <li>• Evaluated and validated pattern matching and PCA method for AHU and VAV fault detection</li> <li>• Implemented various HVAC system faults in real fields</li> <li>• Evaluated fault impact on building energy consumption and system operation</li> <li>• Developed advanced control methods for TES based HVAC system optimal control (Independent Research)</li> </ul>	
<b>Ph.D. Summer Intern, Pacific Northwest National Laboratory</b>	06/2018-09/2018
<ul style="list-style-type: none"> <li>• Developed an operation optimization platform of hybrid energy systems used in commercial buildings.</li> </ul>	
<b>Research and Development Engineer, Beijing Zhuxuntong Mechanical and Electrical Engineering Consultant Co., Ltd</b>	04/2013-05/2015
<ul style="list-style-type: none"> <li>• Led the development of innovative control strategies to enhance ice tank thermal energy storage-based HVAC systems' operations</li> <li>• Led the development and deployment of a novel data-collection and monitoring system for testing VAV terminal unit's performance</li> </ul>	
<b>Senior Instructor, School of Electrical Engineering &amp; Information, Beijing University of Civil Engineering &amp; Architecture (BUCEA), China</b>	07/2002-06/2015
<ul style="list-style-type: none"> <li>• Multiple undergraduate level courses including Digital Circuit, Field-bus Technology, Classical Control Theory, Computer Control Technology Design Project.</li> <li>• Graduate level course: Field-bus and Computer Control Technology</li> <li>• Developed various SCADA platforms (LonWorks-based, Siemens PLC-based, and LabView-based) for teaching smart building technologies</li> <li>• Mentored undergraduate senior design projects</li> </ul>	
<b>Vice Director, Beijing Key Educational Laboratory of Electricity and Intelligent Building</b>	04/2010-03/2012
<ul style="list-style-type: none"> <li>• Led the curriculum design and development for new courses including Circuit lab, Computer Control Technology, Smart Building for undergraduates and graduates</li> <li>• Led the practice teaching collaboration with industrial partners</li> </ul>	

**Research and Development Engineer, Product Manager, Building Fire  
Protection Research Institute, China Academy of Building Research**

07/2014-  
04/2015  
&04/2008-  
07/2009

- Led the development of the airflow sensor array and airflow rate measurement system for monitoring and testing smoke flow in subway tunnel
- Led the development for terminal temperature rise model of Molded Case Circuit Breaker (MCCB)
- Led the development of SCADA-based monitoring systems for testing terminal temperature rise of MCCB

**ACADEMIC RESEARCH EXPERIENCE**

- 2023-present “General Services Administration. Green Proving Ground”, sponsored by General Services Administration and DOE, USA
- 2023-present “Development of IAQ-based Diagnostics for EMIS”, sponsored by DOE, USA
- 2022-present “Optimal Fault-free Control: Development of Automated Commission Tool for Fault Root Cause Analytics”, sponsored by DOE, USA
- 2022-2023 “Development of Smart Thermostat-based Continuous Optimization Technology”, sponsored by DOE, USA (Co-PI)
- 2022-2023 “HVAC Sensor Suitcase Upgrade”, sponsored by DOE, USA
- 2019-2023 “Development and deployment of the HVAC system fault self-correction strategy”, sponsored by DOE, USA
- 2019-2022 “Investigation on HVAC System Fault Prevalence”, sponsored by DOE, USA
- 2019-2022 “HVAC system fault detection and diagnostic data set construction and curation”, sponsored by DOE, USA
- 2015-2019 “VOLTTRON Compatible Whole Building Root-Fault Detection and Diagnosis”, sponsored by DOE, USA
- 2016-2017 “Demonstrating VOLTTRON Platform and Transactive Energy Solutions at Drexel University”, sponsored by DOE, USA
- 2015-2016 “Pattern matching and PCA method for AHU and VAV terminal fault detection and diagnosis”, Funded by Consortium for Building Energy Innovation (CBEI) and DOE, USA
- 2014-2015 “Development on the Test Platform of VAV-Box Dynamic Response”, Sponsored by Beijing Zhuxuntong Mechanical and Electrical Engineering Cooperation, China. Funding 200K. (PI).
- 2013-2015 “Research on Optimal Control of Cooling Thermal Energy Storage in Commercial Building”, Sponsored by University Research Program, China. Funding 120K. (PI).
- 2013-2015 “Development of Airflow Speed Test Platform Used in Subway Station”, China Academy of Building Research, China. Funding 350K. (Co-PI).
- 2010-2011 “Research of the Effects of Underground Power Grid on Urban Development in China”, Sponsored by International Copper Alliance (ICA), China, Funding 100K. (PI).
- 2011-2015 “The research on system identification method for the run-time state of air-conditioning”, Sponsored by Beijing Educational Committee, China. Funding 10K. (Co-PI).

- 2006-2010 “Research on Water Cycling Water Control Used in Central Air-conditioning Based on PLC Control System”, Sponsored by Beijing Educational Committee, China. Funding 200K. (Co- PI).
- 2008-2009 “Research on MCCB (Mold Case Circuit Breaker) Reliability in Building”, Sponsored by National Scientific and Research Support Program for 12<sup>th</sup> Five-year Plan - - “High Efficiency Building Sub-research Program”. China Academy of Building Research, China. Funding 600K. (Co-PI).
- 2007-2008 “Research on Building Monitoring System Based on LonWorks Technology”, Sponsored by University Research Program, China. Funding 15K. (PI)

## **PUBLICATIONS & PRESENTATIONS**

### **Peer-Reviewed Journal Articles**

- Armando Casillas, **Yimin Chen**, Jessica Granderson, Guanjing Lin, Zhelun Chen, Jin Wen, Sen Huang. Development of High Fidelity Air Handling Unit Fault Models for FDD Innovation: Lessons Learned and Recommendations. Journal of Building Performance Simulation. DOI: <https://doi.org/10.1080/19401493.2024.2382757>
- **Yimin Chen**, Zhelun Chen, Guanjing Lin, Yun Zhang, Shi Ye. A novel evaluation method of measurement sensitivities on common faults in VAV HVAC systems, Building and Environment. 261(2024), 1-17. DOI: <https://doi.org/10.1016/j.buildenv.2024.111683>
- Shanshan Wan, Mengnan Zhao, **Yimin Chen**, Shuyue Yang, Dongwei Qiu, James Lo. A Novel Data-Driven Relationship Inference Approach for Automatic Data Tagging in Building Heating, Ventilation and Air Conditioning Systems. Building and Environment 246 (2023), 1-12. DOI: <https://doi.org/10.1016/j.buildenv.2023.110968>
- Eliot Crowe, **Yimin Chen**, Hayden Reeve, David Yuill, Amir Ebrahimifakhar, Yuxuan Chen, Lucas Troup, Amanda Smith, Jessica Granderson. Empirical Analysis of the Prevalence of HVAC Faults in Commercial Buildings. Science and Technology of Built Environment. 0 (2023), 1-12. DOI: 10.1080/23744731.2023.2263324
- Jessica Granderson, Guanjing Lin, **Yimin Chen**, Armando Casillas, Jin Wen, Zhelun Chen, Piljae Im, Sen Huang, and Jiazhen Ling. A labeled dataset for building HVAC systems operating in faulted and fault-free states. Scientific Data 10. 342 (2023). <https://doi.org/10.1038/s41597-023-02197-w> (Corresponding author)
- Zhelun Chen, Zheng O'Neill, Jin Wen, Ojas Pradhan, Tao Yang, Xing Lu, Guanjing Lin, Shohei Miyatad, Seungjae Lee, Chou Shen, Roberto Chiosa, Marco Savino Piscitelli, Alfonso Capozzoli, Franz Hengel, Alexander Kühner, Marco Pritoni, Wei Liu, John Clauß, **Yimin Chen** and Terry Herr. A review of data-driven fault detection and diagnostics for building HVAC systems. Applied Energy 339(2023), DOI: <https://doi.org/10.1016/j.apenergy.2023.121030>
- Guanjing Lin, Marco Pritoni, **Yimin Chen**, Ralph Vitti, Christopher Weyandt, Jessica Granderson. Implementation and test of an automated control hunting fault correction algorithm in a fault detection and diagnostics tool. Energy and Buildings 283(2023), DOI: <https://doi.org/10.1016/j.enbuild.2023.112796>
- **Yimin Chen**, Jin Wen, Ojas Pradhan, James Lo, Teresa Wu. Using Discrete Bayesian Networks for Diagnosing and Isolating Cross-level Faults in HVAC systems, Applied Energy 327(2022), DOI: <https://doi.org/10.1016/j.apenergy.2022.120050>

- **Yimin Chen**, Guanjing Lin, Zhelun Chen, Jin Wen, Jessica Granderson. A simulation-based evaluation of fan coil units fault effects, *Energy and Buildings*. 263(2022), DOI: <https://doi.org/10.1016/j.enbuild.2022.112041>
- Marco Pritoni, Guanjing Lin, **Yimin Chen**, Raphael Vitti, Christopher Weyandt, Jessica Granderson. From fault-detection to automated fault correction: an empirical study. *Building and Environment*. 214(2022), DOI: <https://doi.org/10.1016/j.buildenv.2022.108900>
- **Yimin Chen**, Jin Wen, James Lo. Using Weather and Schedule based Pattern Matching and Feature based PCA for Whole Building Fault Detection -- Part II Field Evaluation. *ASME Journal of Engineering for Sustainable Buildings and Cities*. 2022, 3(1), <https://doi.org/10.1115/1.4052730>
- **Yimin Chen**, Jin Wen, James Lo. Using Weather and Schedule based Pattern Matching and Feature based PCA for Whole Building Fault Detection -- Part I Development of the Method. *ASME Journal of Engineering for Sustainable Buildings and Cities*. 2022, 3(1), DOI: [doi.org/10.1115/1.4052729](https://doi.org/10.1115/1.4052729)
- **Yimin Chen**, Guanjing Lin, Eliot Crowe, Jessica Granderson, Development of a Unified Taxonomy for HVAC System Faults, *Energies*. 2021.14, DOI: [doi.org/10.3390/en14175581](https://doi.org/10.3390/en14175581) (*Selected as the Interesting Contribution by the editor*)
- Ojas Pradhan, Jin Wen, **Yimin Chen**, Teresa Wu. Dynamic Bayesian Network for Fault Diagnosis. *ASHRAE Transactions*, 2021, Vol 127, Issue 2 (Extended Abstract).
- Janghyun Kim, Trenbath Kim, Jessica Granderson, **Yimin Chen**, Eliot Crowe, Hayden Reeve, Sarah Newman, Paul Ehrlich. Research challenges and directions in HVAC fault prevalence, *Science and Technology of Built Environment*. 2021, 4, 624-640, DOI: [10.1080/23744731.2021.1898243](https://doi.org/10.1080/23744731.2021.1898243)
- Guanjing Lin, Marco Pritoni, **Yimin Chen**, Jessica Granderson. 2020, Development and Implementation of Fault-Correction Algorithms in Fault Detection and Diagnostics Tools, *Energies*. 2020, 13, 2598; doi:10.3390/en13102598
- Junhua Zhuang, **Yimin Chen**, Xiangguang Chen. “A new simplified modeling method for model predictive control in a medium-sized commercial building: A case study”. *Building and Environment*. 127(2018), 1-12; dx.doi.org/10.1016/j.buildenv.2017.10.022
- Junhua Zhuang, **Yimin Chen**, Xiaoxia Shi, Dong Wei. “Building Cooling Load Prediction Based on Time Series Method and Neural Networks”. *International Journal of Grid Distribution Computing*. Vol 8, No. 4 (2015). 105-114. <http://dx.doi.org/10.14257/ijgdc.2015.8.4.10>
- Mingzhu Zhang, Huaiqun Wang, **Yimin Chen**. “Development of PCBs functional tester with relay matrix network”. *Applied Mechanics and Materials*, Vols. 336-338(2013), 76-79
- Dongling Ma, **Yimin Chen**. “Public Utility Tunnel Planning and Overhead Lines Underground Laying in Beijing”. *Municipal Engineering Technology*. 5(2014). 120-123
- Jingwan Liu, Dong Wei, **Yimin Chen**, Junhua Zhuang, Juan Yu. “Analysis on the Control Strategy of Central Cooling Plant”. *Electrical Application*. 6(2013). 82-86. (In Chinese)
- Duhai Zhou, **Yimin Chen**. “LabVIEW virtual instrument FFT spectrum analyzer based on DSP technology”. *Micro-computer Application*. 13(2010). 66-68. (In Chinese)
- **Yimin Chen**, Yi Lu, Duhai Zhou, Junhua Zhuang. “Research on Module of Temperature Monitoring Based on LonWorks Power Line Communication Technology”. *CHINA INSTRUMENTATION*. 12(2009). 36-38. (In Chinese)

- **Yimin Chen**, Hongwen Li, Xiaoqing Zhang, Jinbo Shen. “Research on Influencing Factors on Temperature Rise in Terminals of MCCB”. *Low-Voltage Apparatus*. 13(2009). 7-9. (In Chinese)
- **Yimin Chen**, Qing Fan, Duhai Zhou, Junhua Zhuang. “Energy Saving Monitoring System in Building Based on Web Technology and LonWorks Fieldbus”. *Low-Voltage Apparatus*. 24(2008). 1-3. (In Chinese)
- Qing Fan, **Yimin Chen**. “Design of Room Environment Data-collecting System Based on ARM Embedded Technology”. *PLC & FA*. 5(2008). 93-95. (In Chinese)
- Zhijian Jiang, Ru Luan, **Yimin Chen**, Dan Zhou, “Research on the Topology to Low Cost Tolerant Type Three-Phase Inverter in Engineering”. *Electrical Application*. 12(2007). 136-139. (In Chinese)
- **Yimin Chen**, Qing Fan, Lin Deng. “Application of Network Monitor and Control System Based on LNS DDE Server”. *Journal of Beijing Institute of Civil Engineering and Architecture*. 12(2006). 59-61. (In Chinese)
- **Yimin Chen**. “Discussion on Smart Home Designing”. *Information of Intelligent Building and City*. 11(2004). 17-20. (In Chinese)
- **Yimin Chen**, Dong Wei, Duhai Zhou, Mingzhu Zhang. “Research on the practical teaching of electricity and electronics at University of Minnesota in the USA. *Experimental Technology and Management*”. 8(2013). 175-178. (In Chinese)
- **Yimin Chen**, Hongyan Ma, Mingzhu Zhang. “Research on electrical engineering education program for undergraduates at University of Minnesota in the USA”. *Experimental Technology and Management*. 12(2012). 175-178. (In Chinese)
- **Yimin Chen**, Dong Wei, Zhixin Chen, Lifeng Sun. “Research on the Construction of Laboratory of LonWorks Fieldbus Technology and the Practical Teaching”. *Research and Exploration in Laboratory*. 5(2007).61-63. (In Chinese)
- Duhai Zhou, **Yimin Chen**. “Discussion on Teaching Methods of Electronic Technique Curriculum Practice of Automation Major”. *Research and Exploration in Laboratory*. 24(2005). 70-72. (In Chinese)
- Dong Wei, **Yimin Chen**. “Research on Course Design and Exercise of Computer Control System”. *Research and Exploration in Laboratory*. 24(2005). 219-223. (In Chinese)

#### Peer-Reviewed Conference Proceedings

- **Yimin Chen**, Eliot Crowe, Jessica Granderson. Development of Self-correction Algorithms for Thermostats Using OpenAPI Capabilities. *Proceeding of 2024 8th International High Performance Buildings Conference at Purdue*. West Lafayette, IN, U.S. July 14-18, 2024
- **Yimin Chen**, Eliot Crowe, Guanjing Lin, Jessica Granderson. Integration of FDD Data to Enhance HVAC System Maintenance. *BuildSys '22: Proceedings of the 9th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation*, November 9, 2022. Pages 492–495. DOI: <https://doi.org/10.1145/3563357.3567405>
- Marco Pritoni, Guanjing Lin, **Yimin Chen**, John House, Eliot Crowe, Jessica Granderson. Market Barriers and Drivers for the Next Generation Fault Detection and Diagnostics Tools. *ACEEE Summer Study 2022 Conference*. Pacific Grove, CA. U.S. August 21-25, 2022

- Eliot Crowe, **Yimin Chen**, Jessica Granderson, Hayden Reeve, Lucas Troup, David Yuill, Yuxuan Chen. What We Learned from Analyzing 18 Million Rows of Commercial Buildings' HVAC Fault Data. ACEEE Summer Study 2022 Conference. Pacific Grove, CA. U.S. August 21-25, 2022
- Armando Casillas, **Yimin Chen**, Guanjing Lin, Jessica Granderson, Sen Huang, Zhelun Chen, Modeling Air Handling Units to Create a Diverse Fault Dataset for FDD Innovation: Lessons Learned and Recommendations, Proceeding of 2022 7th International High Performance Buildings Conference at Purdue. West Lafayette, IN. U.S. July 10, 2022.
- **Yimin Chen**, Zhelun Chen, Guanjing Lin, Jin Wen, Jessica Granderson. A simulation-based method to analyze fan coil unit fault impacts. 2022 ASHRAE Annual Conference. Toronto, Canada. June 25, 2022
- Ojas Pradhan, Jin Wen, **Yimin Chen**, Xing Lu, Mengyuan Chu, Yangyang Fu, Teresa Wu, K. Selcuk Candan. Dynamic Bayesian Network-Based Fault Diagnosis for ASHRAE Guideline 36: High Performance Sequence of Operation for HVAC Systems. BuildSys '21: Proceedings of the 8th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation. November 2021. Pages 365–368. DOI: <https://doi.org/10.1145/3486611.3491124>
- Guanjing Lin, Marco Pritoni, **Yimin Chen**, Ralph Vitti, Christopher Weyandt, Jessica Granderson. Fault “Auto-correction” for HVAC Systems: A Preliminary Study. 2021 Purdue High Performance Buildings Conference, West Lafayette, IN, USA. May 10. 2021
- Amir Ebrahimifakhar, David Yuill, Amanda D. Smith, Jessica Granderson, Eliot Crowe, **Yimin Chen**, Hayden Reeve. Analysis of Automated Fault Detection and Diagnosis Records as an Indicator of HVAC Fault Prevalence: Methodology and Preliminary Results. 2021 Purdue High Performance Buildings Conference, West Lafayette, IN, USA. May 11. 2021
- **Yimin Chen**, Eliot Crowe, Guanjing Lin, Jessica Granderson. What's in a Name? Developing a Standardized Taxonomy for HVAC System Faults. ACEEE Summer Study 2020. Pacific Grove, CA. U.S. August 16-18, 2020.
- Guanjing Lin, Marco Pritoni, **Yimin Chen**, Kozlen S Moromisato Ricardo, Jessica Granderson. Can We Fix It Automatically? Development of Fault Auto-correction Algorithms for HVAC and Lighting Systems. ACEEE Summer Study 2020. Pacific Grove, CA. U.S. August 16-18, 2020.
- **Yimin Chen**, Vikas Chandan, Yunzhi Huang, M.J.E. Alam, Lane Smith, Osman Ahmed “Coordination of Behind-the-Meter Energy Storage and Building Loads Optimization with Deep Learning Models”, 2019 ACM International Workshop on Applied Machine Learning for Intelligent Energy Systems (AMLIES). Phoenix, AZ. June 5, 2019
- Junhua Zhuang, **Yimin Chen**. “Cascade control for supply air temperature in a variable air volume system”, 2018 The 4th IBPSA Asia Conference. Hongkong, China. December 3-5, 2018
- **Yimin Chen**, Jin Wen. “Development and Field Evaluation of Data-Driven Whole Building Fault Detection and Diagnosis Strategy”, 2018 Prognostics and Health Management, Philadelphia, PA, USA. September 24-27, 2018. DOI: <https://doi.org/10.36001/phmconf.2018.v10i1.517>
- **Yimin Chen**, Jin Wen, Taiyu Chen, Ojas Pradhan. “Bayesian Networks for Whole Building Level Fault Diagnosis and Isolation”, 2018 Purdue High Performance Buildings Conference, West Lafayette, IN, USA. July 9-12, 2018

- **Yimin Chen**, Jin Wen. “A Whole Building Fault Detection Using Weather Based Pattern Matching and Feature Based PCA Method”, 2017 IEEE International Conference on Big Data (IEEE Big Data 2017) Boston, MA, USA. December 11-14, 2017
- Junhua Zhuang, Xiangguang Chen, **Yimin Chen**. “Model Predictive Control with Feedforward Structure for Chilled Water Temperature in HVAC System”, 2017 China Automation Conference (CAC 2017) Jinan, Shandong, China. September 22-23, 2017
- **Yimin Chen**, Jin Wen. “Whole Building System Fault Detection Based on Weather Pattern Matching and PCA Method”, 2017 3<sup>rd</sup> International Conference on Control Science and Systems Engineering (ICCSSE 2017). Beijing, China. August 18-19, 2017
- Junhua Zhuang, Xiangguang Chen, **Yimin Chen**. “Dynamic Modeling of Indoor Air Temperature Based on Power Spectral Density Method”, 2017 3<sup>rd</sup> International Conference on Control Science and Systems Engineering (ICCSSE 2017). Beijing, China. August 18-19, 2017
- Liang Zhang, Jin Wen, **Yimin Chen**. “Systematic Feature Selection Process Applied in Short-Term Data-Driven Building Energy Forecasting Models: a Case Study of a Campus Building”, ASME 2017 Dynamic Systems and Control Conference, Tysons Corner, VA, USA.
- **Yimin Chen**, Jin Wen, Adam Reigner. “Using Pattern Matching and Principal Component Analysis Method for Whole Building Fault Detection”. 2017 ASHRAE Annual Conference. Long Beach, CA, USA. June 25-28, 2017
- **Yimin Chen**, Jie Wu, Zhuangju Li, Junhua Zhuang, Dong Wei. “Research on VAV-box Control Performance Evaluation Based on Hardware and Software Simulation”. IBPSA Asia Conference, Nagoya, Japan. Nov. 21-23, 2014
- Junhua Zhuang, Jin Ping, **Yimin Chen**. “The application of rotary encoder to frequency measurement handset”. 20<sup>th</sup> Conference on Measurement, Control, Monitor and Instrument (MCMI). Xian, China. July 10-11, 2010
- **Yimin Chen**, Dong Wei, Junhua Zhuang. “Design of MCCB Terminal State Monitoring Platform Based on Technology of Power Line Communication”, ISTAI2010 Proceedings of the Third International Symposium on Test Automation & Instrumentation. Xiamen, China. May 8-9, 2010
- Qing Fan, Yingzi Li, **Yimin Chen**, Zhijian Jiang. “The Influence of Grid-Connected Photo Voltaic (PV) Systems from the Different Types of Load”. Proceedings of ISES Solar World Congress 2007 – Solar Energy and Human Settlement. Beijing, China. Sep. 11-13, 2007

## **Presentations**

- **Yimin Chen**, Zhelun Chen, Guanqing Lin, Jin Wen, Jessica Granderson. A simulation-based method to analyze fan coil unit fault impacts. 2022 ASHRAE Annual Conference. Toronto, Canada. June 25, 2022
- **Yimin Chen**. Development and Implementation of Fault-Correction Algorithms in Fault Detection and Diagnostics Tools. 2021 ASHRAE Summer Conference. June 30, 2021
- **Yimin Chen**. What's in a Name? Developing a Standardized Taxonomy for HVAC System Faults. 2020 ACEEE Summer Study. Virtual Conference. August 17, 2020
- **Yimin Chen**. Coordination of Behind-the-Meter Energy Storage and Building Loads Optimization with Deep Learning Models. 2019 ACM International Workshop on Applied Machine Learning for Intelligent Energy Systems (AMLIES). Phoenix, AZ. June 5, 2019



- **Yimin Chen.** Data-driven Whole Building Fault Detection and Diagnosis. Invited talk at Lehigh University Energy Seminar Series. Lehigh University, Bethlehem, PA. January 31, 2019
- **Yimin Chen, Jin Wen.** Development and Field Evaluation of Data-Driven Whole Building Fault Detection and Diagnosis Strategy, 2018 Prognostics and Health Management, Philadelphia, PA. September 25, 2018
- **Yimin Chen.** Bayesian Networks for Whole Building Level Fault Diagnosis and Isolation, 2018 Purdue High Performance Buildings Conference, West Lafayette, Indiana. July 11, 2018
- **Yimin Chen, Jin Wen.** A Whole Building Fault Detection Using Weather Based Pattern Matching and Feature Based PCA Method, 2017 IEEE International Conference on Big Data (IEEE Big Data 2017) Boston, MA. December 12, 2017
- **Yimin Chen, Taiyu Chen, Ojas Pradhan.** Using Bayesian Networks to Diagnose Whole Building Level Fault. 2018 10<sup>th</sup> Drexel IEEE Graduate Symposium. Philadelphia, PA. April 4, 2018
- **Yimin Chen.** Pattern Matching and Principal Component Analysis Method for Whole Building Fault Detection. 2017 9<sup>th</sup> Drexel IEEE Graduate Symposium. Philadelphia, PA. March 12, 2017
- **Yimin Chen.** VOLTTRON Compatible Whole Building Root-Fault Detection and Diagnosis (Poster). Building Technology Office (BTO) Annual Peer Review, Department of Energy. Washington D.C. April 14, 2016
- **Yimin Chen.** Research on VAV-box Control Performance Evaluation Based on Hardware and Software Simulation. IBPSA Asia Conference, Nagoya, Japan. November 23, 2014
- **Yimin Chen.** Development of Undergrounding the Over-heading Power Line in Beijing. International Copper Alliance Conference of Over-heading Power Line Conference, Singapore. May 25, 2011

## Book Chapters

- Jin Wen, **Yimin Chen**, Adam Regnier. Chapter “Building Fault Detection and Diagnostics” in the Book “Encyclopedia of Systems and Control” Second Edition (John Baillieul and Tariq Samad). Springer. August 2021. ISBN 978-3-030-44183-8
- Xiaoxia Shi, **Yimin Chen**, Junhua Zhuang, Qing Fan. “Data Mining and Machine Learning in Building Energy Analysis”. (Translation). China Machine Press. July, 2018. ISBN: 978-7-111-60267-5
- **Yimin Chen**, Xiaoxia Shi, Qing Fan, Junhua Zhuang. “Modeling, Design, and Optimization of Net-Zero Energy Buildings”. (Translation). China Machine Press. Nov. 2017. ISBN: 978-7-111-57484-2
- **Yimin Chen**, Jinghua Zhou, Sanmin Wei, Weifeng Su. “Predictive Control of Power Converters and Electrical Drivers”. (Translation). China Machine Press. 2015. ISBN: 978-7-111-48714-2
- **Yimin Chen**, Xiaoxia Shi, Qing Fan. “Diagrammatic Reasoning in AI”. (Translation). China Machine Press. 2012. ISBN: 978-7-111-35620-2
- Xiaoxia Shi, **Yimin Chen**. “Neural Networks for Applied Sciences and Engineering—From Fundamentals to Complex Pattern Recognition”. (Translation). China Machine Press. 2010: ISBN: 978-7-111-27585-5

- Hongwen Li, Jinbo Shen, **Yimin Chen**. “Technique Application of Electrical Fire Protection in Buildings”. China Building Industry Press. 2010. ISBN: 7-112-12597-5
- Yuling Hu, liquan Zhang, Yanjun Liu, **Yimin Chen**. “Fuzzy Controller Design Theory and Applications”. (Translation Work). China Machine Press. 2010. ISBN: 978-7-111-29102
- Junhong Zhang, Yahui Wang, **Yimin Chen**. “Simulation on Control System and MATLAB Applications”. China Machine Press. 2011. ISBN: 7-111-31328-1
- Junhua Zhuang, Junhong Zhang, **Yimin Chen**. “Introduction and Application of Multisim9”. China Machine Press. 2008. ISBN: 978-7-111-23440-1
- Dong Wei, Junhua Zhuang, Junhong Zhang, **Yimin Chen**. “Computer Control System”. China Machine Press. 2007. ISBN: 978-7-111-21373-4
- Shaojun Zhang, **Yimin Chen**. “Intelligent Building System and Technology”. China Electric Power Press. 2006. ISBN: 7-5083-4877-x
- Xinguo Liu, Zhixin Chen, Yingzi Li, **Yimin Chen** et al., “Hand Book of Building Electrical Equipment Installation”. China Machine Press. 2007. ISBN: 7-111-16909-3

## **PATENTS**

- Hongwen Li, **Yimin Chen**, Guohua Li et al., “Airflow sensor array and airflow rate measurement equipment”. China’s Patent, ZL 201520230990.8
- Hongwen Li, Yunhao Li, Xiaodong Li, **Yimin Chen**, Hao Zhang, Peng Ran et al., “Test system and method for airflow rate on the subway platform and in the subway tunnel”. China’s Patent, ZL 201510179893.5
- Junhua Zhuang, Jie Wu, **Yimin Chen**, Jun Wang “A control method of supply air temperature in Variable Air Volume air-conditioning system”. China’s Patent, ZL 201811453383.2

## **SOFTWARE DISCLOSURE**

- Vitti R, Weyandt C, Lin G, Pritoni M, **Yimin C**, Granderson J, Haxall-based (Axon) fault auto-correction package for building HVAC systems. 2022.
- **Yimin C**, Lin G, Najibi R, Fernandes S, Retro-Commissioning Sensor Suitcase Plus. 2022

## **TEACHING & MENTORING**

- 2018. Nomination for Drexel Annual Best Teaching Assistant, Annual Best Mentor
- 2017. Winter Quarter. Volunteer Teaching Assistant. AE-580 Data and Communication in Buildings. Drexel University
- 2017. Winter Quarter. Teaching Assistant. CIVE-330 Hydraulic Lab. Drexel University
- 2017. Fall Quarter. Teaching Assistant. CAEE202 Introduction to Civil, Architectural and Environmental Engineering. Drexel University
- 2018. Undergraduate student mentoring: Jaymes Bailey, Ojas Pradhan, Crompton Hans, Taiyu Chen, Noor Solatch
- 2017. Undergraduate student mentoring: Mahamoudou Doumbia, Taiyu Chen, Benjamin Scheinberg, Raj Patel
- 2016. Master student mentoring: Taylor Castonguay, Bingbing Fan, Jianwen Yu, Manoj Tuguru. Drexel University

- 2004-2015. Classical Control Theory, Computer Control System, Field-bus Technology, Circuit Theory, Digital Circuit. Beijing University of Civil Engineering and Architecture

## **PROFESSIONAL ASSOCIATIONS & SERVICES**

- Senior Member, Institute of Electrical and Electronics Engineers (IEEE) 2023-present
- Member, American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) 2015-present
- Member, International Building Performance Simulation Association (IBPSA), 2014-present
- Reviewer Board Member: Science and Technology of Built Environment (STBE), since 2020
- Reviewer for Journals: Energy and Buildings, Electronics, ASME Journal of Heat Transfer, Energies, Aerospace, IEEE Automatic, IEEE Sensors Journal
- Reviewer for Conferences: ASHRAE Annual Conference (2018), Prognostics and Health Management Annual Conference (2018), America Council for an Energy-Efficient Economy (ACEEE 2020)
- Session Chair: IBPSA Asia Conference, Nagoya, Japan. Nov. 2014
- Program Committee member: IEEE Big Data (2020)
- Technical Program Committee member: International Workshop on Applied Machine Learning for Intelligent Energy Systems (AMLIES), ACM e-Energy Conference 2019, 2020, 2021, 2023

## **HONORS & AWARDS (SELECTED)**

- 8<sup>th</sup> Annual Science and Technology Innovation Award. First Class Award. “Research on Electrical Fire Protection and Monitoring”. Awarded by China Fire Protection Association, 2018
- Sustainable Energy Fund Scholarship (2018). Support to attend “Energy Path 2018” in DeSales University, Center Valley, PA. Awarded by Sustainable Energy Fund. 2018
- Drexel Graduate Travel Award (2017-2018). Support to attend IEEE Big Data 2017 in Boston, MA. Awarded by Drexel University. 2017
- Foundation of the Association of Energy Engineers (FAEE) Scholarship. Awarded by Association of Energy Engineers. 2017
- Lee Smith Travel Fellowship (2017). Support to attend 2017 3<sup>rd</sup> International Conference on Control Science and Systems Engineering, Beijing China. Awarded by Drexel University
- ASHRAE-Philadelphia Winter Travel Grant. 2017 Support to attend 2017 Winter ASHRAE conference in Las Vegas, NV. Awarded by ASHRAE Philadelphia Chapter
- Building Grid Integration Research and Development Innovation Program (BIRD-IP). Awarded by the Department of Energy (DOE), US. 2016
- Best Mentor Award for “2014 Siemens Cup for National Undergraduates Automation Contest”, Northern China Contest Region. Awarded by Siemens China and the Ministry of Education, China. 2014
- Best Mentor Award for “Rockwell Automation Summer Camp”, Awarded by Rockwell Automation Cooperation, China. 2013

- Teaching Award of University for “Theory of Automatic Control”, Awarded by Beijing University of Civil Engineering and Architecture. 2011
- Teaching Award of University for “Building of Computer Control Lab”, Awarded by Beijing University of Civil Engineering and Architecture. 2011
- Best Mentor Award for “2010 Second National Undergraduate Contest for Intelligent Building Engineering Practice”. 2010. China. Awarded by the Electrical and Smart Building Teaching Consulting Committee, the Ministry of Housing and Urban-Rural Development of China. 2010
- Best Paper Award for “Laboratory Academic Proceeding in Higher Education of Beijing”. Awarded by Beijing Association of Higher Education Laboratory. 2010
- Group member in “Beijing Excellent Teaching Group of Electrical and Smart Building”. Awarded by Beijing Education Committee. 2010
- “Award for Annual Excellent Performance Faculty of University”, Awarded by Beijing University of Civil Engineering and Architecture, 2003,2011,2012,2015
- Teaching Award of University for “Computer Control Technology”, Awarded by Beijing University of Civil Engineering and Architecture. 2008

## **TECHNICAL SKILLS**

**Programming Language:** Python, MATLAB, Simulink, R, Go, C, VB, MySQL

**SCADA and BAS Tools:** LabVIEW, Siemens Programmable Logic Controller (PLC), LonWorks Integration Tool

**Modeling Tool:** EnergyPlus, OpenStudio, Modelica, TRNSYS

**Data Analytics Tool:** Tableau