

傅 群 Chun Fu

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個人亮點

- **淨零領域的學業界經歷:** 在新加坡國立大學 (達成新加坡第一個淨零建築) 進行博士研究; 在歐洲的 Centrica (著名的大型跨國能源公司) 從事淨零能源研發及參與多個歐盟的大型能源計劃
- **優異的期刊發表產出:** 在頂尖期刊 (如 Applied Energy, Energy and Buildings, 排名前 5%) 發表 3 篇第一作者與 6 篇合作論文、參與知名研討會 (如 IEEE 和 ACM), 學術合作橫跨亞洲、歐洲和美國
- **積極參與社群活動:** 主辦國際研討會的能源預測工作坊、受台灣電力公司邀請講座、受 Project Tyra 和多所大學邀請演講、和 Python 亞太地區研討會演講等
- **多項獎學金和競賽優勝:** 獲得新加坡博士獎學金和台灣留學獎學金, 並在多項機器學習競賽獲獎, 包括歐洲西門子永續黑客松 (第一名, 獎金 5,000 歐元) 和 Kaggle 電網能源預測競賽 (全球 2731 支隊伍中排名前 1%)

學術背景

新加坡國立大學 National University of Singapore (NUS) Jan 2020 - Jan 2024
博士, 建築環境系 (Department of the Built Environment)

魯汶大學 KU Leuven Nov 2023 - Jan 2024
訪問學者, 電機系-電能系統與應用組 (Electrical Energy Systems and Applications, ELECTA)

國立臺灣大學 National Taiwan University (NTU) Sept 2013 - June 2015
碩士, 生物環境系統工程學系 Bioenvironmental Systems Engineering

國立臺灣大學 National Taiwan University (NTU) Sept 2009 - June 2013
學士, 生物環境系統工程學系 Bioenvironmental Systems Engineering

業界經歷

淨零能源研發工程師 (高技術工作簽證) Nov 2024 - Oct 2025
Centrica Energy - New Business and Net Zero (NB&NZ), 比利時

- 歐盟 Dedalus 計畫: 研發以住宅用戶為中心的智慧需求響應生態系, 整合 AI 演算法、使用者行為科學和數位分身 (Digital Twin) 技術, 最大化用戶參與度並提升電網彈性
- 歐盟 DigiRES 計畫: 開發與驗證「彈性即服務」(Flexibility-as-a-Service, FaaS), 透過物聯網平台與 AI 模型, 整合住宅和工業用戶的多元能源彈性資產, 使其能參與區域能源市場
- 歐盟 MAESHA 計畫: 透過智慧電網與多元彈性服務, 幫助島嶼能源系統大規模轉用再生能源以達成脫碳目標, 以馬約特島 (Mayotte) 為例, 整合電動車智慧充電、氫能儲存和虛擬電廠等技術

資料科學家 Jan 2024 - Oct 2024
台灣愛淨節能科技股份有限公司, 台灣

- 主導多個建築和高科技廠房的中央空調系統數據分析和機器學習模型模組化工作
- 設計開發最佳化成果和既有控制的儀表板, 用於即時監控節能效果和控制策略
- 進行冰水主機最佳化控制演算法的研發, 平均節能效果可達 10% 以上

探識空間科技有限公司, 台灣

- 與台積電合作研發人工智慧異常檢測和診斷服務，即時監控超過 1000 台空調設備和感測器
- 運用大數據分析北市府的能源使用現況並提出節能策略，包括預測控制、預冷和負載移轉
- 協助新北市開發建築資訊模型 (BIM) 設施管理系統，系統化建立超過 3000 台設備的資訊

學術著作與研究計畫

h-index	總引用次數	第一作者論文	共同作者論文	前 5% 期刊論文
9	266	5	10	7

* 引用數據來源: *Scopus* 和 *Journal Citation Reports (JCR)*

SCI/SCIE 期刊論文

- Lien, S. K., Canaydin, A., Miller, C., **Fu, C.**, Kazmi, H., Rajasekharan, J. (2025). Cross-domain disaggregation of electricity for heating in all-electric school buildings—learning from school buildings with district heating. *Energy and Buildings*, 116359. (**Citations: 0; Impact factor: 6.6; Rank 10/223, Top 5%, in Engineering - Building and Construction**)
- Fu, C.**, Kazmi, H., Quintana, M., & Miller, C. (2024). Creating synthetic energy meter data using conditional diffusion and building metadata. *Energy and Buildings*, 312, 114216. (**Citations: 10; Impact factor: 6.6; Rank 10/223, Top 5%, in Engineering - Building and Construction**)
- Liguori, A., Quintana, M., **Fu, C.**, Miller, C., Frisch, J., & van Treeck, C. (2024). Opening the Black Box: Towards inherently interpretable energy data imputation models using building physics insight. *Energy and Buildings*, 310, 114071. (**Citations: 10; Impact factor: 6.6; Rank 10/223, Top 5%, in Engineering - Building and Construction**)
- Canaydin, A., **Fu, C.**, Balint, A., Khalil, M., Miller, C., & Kazmi, H. (2024). Interpretable domain-informed and domain-agnostic features for supervised and unsupervised learning on building energy demand data. *Applied Energy*, 360, 122741. (**Citations: 11; Impact factor: 10.1; Rank 1/223, Top 1%, in Engineering - Building and Construction**)
- Fu, C.**, Quintana, M., Nagy, Z., & Miller, C. (2024). Filling time-series gaps using image techniques: Multidimensional context autoencoder approach for building energy data imputation. *Applied Thermal Engineering*, 236, 121545. (**Citations: 27; Impact factor: 6.1; Rank 3/96, Top 5%, in Chemical Engineering - Fluid Flow and Transfer Processes**)
- Kazmi, H., **Fu, C.**, & Miller, C. (2023). Ten questions concerning data-driven modeling and forecasting of operational energy demand at building and urban scale. *Building and Environment*, 239, 110407. (**Citations: 40; Impact factor: 7.1; Rank 11/223, Top 5%, in Engineering - Building and Construction**)
- Miller, C., Picchetti, B., **Fu, C.**, & Pantelic, J. (2022). Limitations of machine learning for building energy prediction: ASHRAE Great Energy Predictor III Kaggle competition error analysis. *Science and Technology for the Built Environment*, 1-18. (**Citations: 23; Impact factor: 1.7; Rank 74/223, Top 33%, in Engineering - Building and Construction**)
- Fu, C.**, & Miller, C. (2022). Using Google Trends as a proxy for occupant behavior to predict building energy consumption. *Applied Energy*, 310, 118343. (**Citations: 30; Impact factor: 10.1; Rank 1/223, Top 1%, in Engineering - Building and Construction**)
- Miller, C., Arjunan, P., Kathirgamanathan, A., **Fu, C.**, Roth, J., Park, J. Y., ... & Haberl, J. (2020). The ASHRAE great energy predictor III competition: Overview and results. *Science and Technology*

for the Built Environment, 26(10), 1427-1447. (Citations: 88; Impact factor: 1.7; Rank 74/223, Top 33%, in Engineering - Building and Construction)

國際研討會論文

1. Balint, A., **Fu, C.**, Driesen, J., Kazmi, H. (2024, October). EnFoBench: A community-driven energy forecasting benchmark. In 2024 IEEE PES Innovative Smart Grid Technologies Europe (ISGT EUROPE) (pp. 1-5). IEEE. (Citations: 0)
2. **Fu, C.**, Kazmi, H., Quintana, M., & Miller, C. (2023). Enhancing Classification of Energy Meters with Limited Labels using a Semi-Supervised Generative Model. In Proceedings of the 10th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (pp. 450-453). (Citations: 1)
3. Jin, X., **Fu, C.**, Kazmi, H., Balint, A., Canaydin, A., Quintana, M., ... & Miller, C. (2023, November). The Building Data Genome Directory—An open, comprehensive data sharing platform for building performance research. In Journal of Physics: Conference Series (Vol. 2600, No. 3, p. 032003). IOP Publishing. (Citations: 5)
4. Miller, C., Quintana, M., Frei, M., Chua, Y. X., **Fu, C.**, Picchetti, B., ... & Biljecki, F. (2023, November). Introducing the Cool, Quiet City Competition: Predicting Smartwatch-Reported Heat and Noise with Digital Twin Metrics. In Proceedings of the 10th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (pp. 298-299). (Citations: 6)
5. **Fu, C.**, Arjunan, P., & Miller, C. (2022). Trimming outliers using trees: winning solution of the large-scale energy anomaly detection (LEAD) competition. In Proceedings of the 9th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (pp. 456-461). (Citations: 9)
6. Miller, C., Hao, L., **Fu, C.** (2022). Gradient boosting machines and careful pre-processing work best: ASHRAE Great Energy Predictor III lessons learned. ASHRAE Annual Conference 2022. (Citations: 6)

研究計畫

1. The Cool, Quiet City Competition (2023-2024) –Kaggle competition predicting smartwatch-reported heat and noise. Collaboration with NUS on city-scale digital twin project. *Role: Core Team Member*
2. Cozie Apple Watch (2020-present) –Open-source platform for collecting physiological, environmental, and subjective data via Apple Watch. Collaboration with University of Sydney and UC Berkeley. *Role: Experiment Assistant*
3. ASHRAE Great Energy Predictor III (GEPIII) Competition (2019-2020) –BUDS Lab-organized Kaggle competition on building energy prediction. US\$25,000 prize, 3,614 teams participated. *Role: Core Team Member*
4. 建築耗能與晝光利用權衡下因應未來氣候建築外殼開口部設計策略之研究 (2016). 國科會計畫, 台灣. 擔任研究助理
5. 因應氣候變遷下以立體綠化作為提升環境熱舒適與降低建築耗能調適策略之研究 (2015). 國科會計畫, 台灣. 擔任研究助理

榮譽與獎項

競賽得獎數量	獎學金數量	競賽獎金總額	獎學金總額
8	2	約 930,000 新台幣	約 3,570,000 新台幣

獎項列表

- Global AI Challenge for Building EM Facilities 2025
金牌&演算法最佳效率獎 (10,000 美元)
- Kaggle 機器學習競賽: Enefit - Predict Energy Behavior of Prosumers 2024
銀牌 (全球 2731 隊伍中的第 39 名，前 1%)
- 西門子永續黑客松 (歐洲舉辦): "Swarm Behaviour on the Grid" 2023
第一名 (5,000 歐元)
- AIGO：透過身體組成與健身數據 AI 健身訓練課程推薦系統 2022
提案獲選 (300,000 新台幣)
- 2021 智慧農業數位分身創新應用競賽 2021
總排名第三名，演算法第一名 (50,000 新台幣)
- Aidea 競賽：中科智慧製造-光電製程品質預測 2020
第一名 (50,000 新台幣)
- 第 12 屆創意狂想巢向未來-智慧化居住空間創意競賽 2019
第二名 (50,000 新台幣)
- 臺大書卷獎 2013
系上排名前 5% (2,000 新台幣)

獎學金

- National University of Singapore (NUS) Research Scholarship 2020-2024
博士學位全額獎學金，包含全額學費減免 (總額約 110,000 新加坡幣)
- 台灣教育部 109 年留學獎學金 2020-2024
海外留學博士生獎學金 (總額 32,000 美元)

演講經驗

受邀演講與工作坊

- 2023 台電公司: 數據與電業之旅系列講座-以數據探索能源與評估風險
台灣電力公司邀請演講 2023
- Research Presentation on Data Quality in Energy and Building Systems
荷蘭台夫特理工大學 (TU Delft) 建築系邀請演講 2023
- 從開放數據閱讀台灣能源- 數據探索、模型預測和風險評估
PyCon2022 投稿演講 2022
- ACM BuildSys 2022 Tutorial on Electricity Demand Forecasting
BuildSys2022 工作坊共同主辦人 2022
- 從數據閱讀建築、環境和能源 - 以台灣能源數據為例
Project Tyra 邀請演講 2021
- 結合物聯網控制之能源管理與應用 - 能源管理的下一步
台灣建築中心邀請演講 2018
- EnergyPlus 建築性能模擬工作坊
臺大機械系邀請演講 2016
- DesignBuilder 建築性能模擬系列教學
澄曦環境規劃顧問有限公司邀請演講 2016

研討會演講

- Enhancing Classification of Energy Meters with Limited Labels using a Semi-Supervised Generative Model
BuildSys2023 國際研討會 2023
- Trimming outliers using trees: winning solution of the large-scale energy anomaly detection (LEAD) competition
BuildSys2022 國際研討會 2022

教學經驗

教學助理

2020 - 2024

新加坡國立大學

- **edX: Data Science for Construction, Architecture, and Engineering**
全球超過 40,000 人註冊的開放式線上課程，專注於建築環境中的數據科學和機器學習應用。
- **PF1103: Digital Construction**
必修大學部課程，整合建築工程與數位技術，如建築資訊模型（BIM）和機器學習應用。
- **BPS5229: Data Science for the Built Environment**
關於建築數據（BMS/BIM/IoT）的數據科學應用課程，涵蓋數據探索、視覺化和機器學習建模。
- **PF3211: AI Applications for the Built Environment**
涵蓋人工智慧基礎和建築環境應用的課程，包括機器學習、數據處理，以及空調系統和能源優化的案例研究。

教學助理

2014 - 2015

國立台灣大學

- **GenEdu1004: 使用者經驗設計**
針對特定的設計議題，透過三階段的設計實際演練，不僅能了解單一設計案的執行，同時並能由設計企劃的觀點，提出創新的創業構想。
- **GenEdu1003: 新生講座**
針對大一學生的課程，透過各教授的講座，培養時間管理和數位素養等基本技能。

學術服務

- Journal Reviewer for Energy Conversion and Management, 2025
- Journal Reviewer for Journal of Building Engineering, 2025
- Journal Reviewer for Sustainable Energy, Grids and Networks, 2025
- Journal Reviewer for Energy and Buildings, 2024–2025
- Co-Chair, Workshop on Trust-worthy ML for Energy Systems (SAFE-ENERGY), 15th ACM International Conference on Future and Sustainable Energy Systems, 2024
- Reviewer for ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (BuildSys), 2023
- Co-Chair, Tutorial on Electricity Demand Forecasting, 9th ACM International Conference on Systems for Energy-Efficient Built Environments, 2022
- Co-Organizer, 9th Annex 79 Meeting: Occupant-Centric Building Design and Operation, 2022
- Assistant Reviewer for ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (BuildSys), 2021, 2022
- Assistant Reviewer for ACM International Conference on Future Energy Systems (e-Energy), 2020

研究指導

- Leong Wei Yan (2023): "Investigating the Autoencoder Approach to Detect Building Energy Faults Through the Deviation of Real-Time Energy Use from Reconstructed Baseline"
- Evonne Teng Foong Yee (2022): "Quantifying Uncertainty of Real-Time Energy Model and Its Application"
- Liu Hao (2021): "Remove Outliers and Use Ensembles of Gradient Boosting Trees: Lessons Learned from the ASHRAE GEP III Kaggle Competition"

專業會員與領導經驗

Professional Member <i>Association for Computing Machinery (ACM)</i>	2023 - 2024
Student Member <i>American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)</i>	2020 - 2021
Vice President <i>ASHRAE Branch, National University of Singapore</i>	2020 - 2021
副隊長, 系棒球隊 台大生工系	2010 - 2011
班級代表 台大生工系	2010 - 2011

專業證照

- LEED Green Associate (GA)
- LEED Accredited Professional (AP) with Building Design and Construction (BD+C) Specialty
- Autodesk Building Performance Analysis Certificate (BPAC)
- ISO/IEC 27001:2022 Information Security Management Systems (ISMS) Internal Auditor Certificate