



Orcun Koral Iseri, PhD

Postdoctoral Researcher | Building Physics & AI/ML for BEM/UBEM

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[Blog](#) | [LinkedIn](#) | [ResearchGate](#) | [GoogleScholar](#) | [YouTube](#)

Turkish, English (Professional), French (Fluent), Italian/German (Beginner)



- Postdoctoral Researcher at Concordia University, specializing in **Urban Building Energy Modeling (UBEM)**, **AI/ML for sustainability**, and **data-driven occupancy modeling** of climate-resilient built environments. Currently developing a **modular Neighborhood Unit (NU)** framework for **Canadian urban energy planning** aligned with **NECB / NBC** standards and **net-zero community design** in cold climates.
- Methodological contributions span **stochastic occupancy modeling**, **building stock turnover modeling**, **Sobol sensitivity analysis**, **k-means archetype characterization**, and **deep learning** (time-series, Conditional Variational Autoencoders, Transformers, graph neural networks); fluent in **Python** (TensorFlow, PyTorch, Scikit-learn, SciPy, SALib) and **R**, with **HPC workflows** for large-scale building stock simulation. Research draws on **national statistical datasets** (Census PUMF, GSS Time Use Survey), **mixed-methods**, and **interdisciplinary research design** bridging architecture, computer engineering, and urban planning.
- Published in Q1 journals (*Energy and Buildings*, *Automation in Construction*, *Advanced Engineering Informatics*); **peer reviewer** for *Scientific Reports*; **led TUBITAK 1001-funded research project** (2020–2023) and **co-mentored Master's-level students** in UBEM applications at METU. Track record of **competitive grant participation** (TUBITAK, Newton Fund) and **international collaboration** across Turkey, UK, and Canada.

Experience

Postdoc
Aug. 2025
- continue

BEM & AI/ML

Concordia University, Canada
High Performance Neighborhoods

- Developed **urban energy modeling software/web platform** to design high-performance neighborhood
- Supported a modular **Neighborhood Unit (NU)** framework for **Canadian urban energy planning** that integrates **national building standards**.
- Serve as a **peer reviewer** for **Scientific Reports (2025–Present)** and facilitate ongoing research dissemination.

Lecturer
Jan. 2025
June 2025

BEM & BIM

Bilkent University, Architecture
ARCH 324 - Environmental Technologies
ADA 134 - Designing with Digital Media

- Environmental technologies for sustainable applications, ie, **passive and active design**, building energy certificates, building performance analysis, **key performance indicators**
- Architectural design using digital tools, (AutoCAD, Rhinoceros, Grasshopper, Revit), visualization (Illustrator, Photoshop) and rendering (TwinMotion, Lumion)

Lead Researcher
June 2020
Aug. 2023

UBEM & AI/ML

TUBITAK 1001, Research Project
Development of ML and Simulation-Based Analysis Tool for UBEM for Climate Change

- Development of bottom-up building simulation pipelines (EnergyPlus, Rhino/Grasshopper, Python) and deep learning models for UBEM and climate risk assessment.
- Secured competitive research funding for urban sustainability initiatives, driven by comprehensive urban heat island (UHI) measurements and weather data calibration.

Teaching Assistant
Mar. 2019
June 2020

UBEM & BEM & Data Analysis

Middle East Technical University
ARCH750 – Performative Architecture Lab

- Enhanced the course curriculum by guiding Master's students through real-world UBEM applications using EnergyPlus and Rhino/Grasshopper.
- Collaborated with government agencies to process large-scale urban datasets for evaluating climate-resilient urban models.

Researcher
Jan. 2019
June 2020

BEM & Programming

TUBITAK & Newton Fund
A Stakeholder-Oriented Intelligent System for Building Energy Retrofitting (SISER)

- Assisted in the **AI/ML for 3D reconstruction** and **camera-based occupancy classification**
- Conducted **BEM** for educational facilities and **thermal imaging** for energy diagnostics
- Collected and validated **occupancy and comfort data** using **in-situ sensors**

Researcher
Jan. 2019
Sept. 2019

BEM & Programming

Oluşum Architecture
Cost-Effective Energy Demand Optimization of Apartment Building “nZEB Approach

- Collaborated with the **Ministry of Environment, Urbanization, and Climate Change** and **GIZ** to optimize building energy performance for **Turkish Insulation Standards (TS-825)**
- Simulated energy performance using **genetic algorithms** (HYPE, NSGA-II) and **life-cycle cost analysis** to propose **near-zero energy building (nZEB)** solutions, eg. insulation, geothermal.

Lecturer
Jan. 2018
Jan. 2019

Computational & BEM & BIM

Yasar University, Architecture
ARCH 211 - Computational Design
ARCH 450 - AI/ML in Architecture
ARCH 380 - Building Information Modeling

- Taught **computational design tools** (Rhino/Grasshopper) for ARCH211
- Lectured **AI/ML-based performance modeling** for ARCH450
- Introduced **Building Information Modeling (BIM)** practices using Revit for ARCH380
- Supervised **environmental site analyses** and participated in the end-of-year **design juries**

Education

Doctorate
Jan. 2019
Sep. 2024

UBEM & AI/ML

Middle East Technical University,
School of Applied Sciences,
Faculty of Architecture

Thesis: *Occupancy Modeling for Sustainable Transformation of Residential Building Stock*

- Developed **deep learning models** (time-series) to improve occupancy representation in UBEM
- **Advisor:** Prof. Dr. Ipek Gursel Dino, **Co-advisor:** Prof. Dr. Sinan Kalkan (Computer Engineering)

MSc
Sep. 2016
June 2018

BEM & Statistics

Yasar University,
School of Applied Sciences,
Faculty of Architecture,
%100 scholarship

Thesis: *The influence of early design decisions on energy demand: A quantitative assessment using sensitivity analysis*

- Applied sensitivity analysis (Sobol) using Python (Eppy/Geomeppy, Scipy, SALib, Numpy)
- Specialized in **thermodynamics** and **statistical modeling** for energy system evaluations.
- **Advisor:** Dr. Onur Dursun (Civil Engineer)

Bachelor
Sep. 2012
June 2016

Yasar University,
Faculty of Architecture,
%100 scholarship

Online Education:

CENG 501: Deep Learning
MITx 6.431x: Probability
MITx 6.86x: ML with Python

High School

Le Lycée Français
Saint Joseph d'Izmir, %100
scholarship

Publications

- Journal Power Systems
- Hachem-Vermette, C., Iseri, O. K., Subedi, A., Hassan, A. N. M., McNevin, C., & Razavi, F. (2026). Technological synergies in community energy systems in cold climates. *Energies*, 19(5), Article 1198. <https://doi.org/10.3390/en19051198>
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- Journal UBEM, AI/ML
- Iseri, O. K., Hachem-Vermette, C., Longitudinal Analysis of Occupancy-Driven Energy Demand in Canadian Residentials, *Journal of Building Performance Simulation*. *Under Evaluation*
 - Hachem-Vermette, C., Iseri, O. K. Development of Neighborhood Archetypes and Their Translation into Parametric Neighborhood Units for Scalable Urban Energy Simulation, *Energy and Buildings*. *Under Evaluation*
 - Iseri, O. K., Gürsel Dino, İ., & Kalkan, S. (2026). Occupancy modeling using population statistics and machine learning for urban residential built environment. *Energy and Buildings*, 357, Article 117155. <https://doi.org/10.1016/j.enbuild.2026.117155>
 - Iseri, O. K., A. Duran, I. Canlı, C. Meral Akgül, S. Kalkan, I. Gursel Dino, A method for zone-level urban building energy modeling in data-scarce built environments, *Energy and Buildings* (2025) 115620. <https://doi.org/https://doi.org/10.1016/j.enbuild.2025.115620>.
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- Journal BEM, AI/ML
- Akin, S., Iseri, O. K., Dino, I. G., & Erdogan, B. (2022). Exploratory and Multi-objective Decision-Making Methods for Retrofit Planning Processes. *International Journal of Digital Innovation in the Built Environment*. [10.4018/IJDIBE.301244](https://doi.org/10.4018/IJDIBE.301244)
 - Dino, I. G., Kalfaoglu, E., Iseri, O. K., Kalkan, S., & Alatan, A. A. (2022). Vision-based Estimation of the Number of Occupants using Video Cameras. *Advanced Engineering Informatics*. [10.1016/j.aei.2022.101662](https://doi.org/10.1016/j.aei.2022.101662)
 - Iseri, O. K., & Dursun, O. (2022). The Impacts of Early Architectural Design Decisions on Building Performance. *International Journal of Digital Innovation in the Built Environment (IJDIBE)*, 11(2), 1–21. [10.4018/IJDIBE.301245](https://doi.org/10.4018/IJDIBE.301245)
 - Dino, I. G., Sari, A. E., Iseri, O. K., Akin, S., Kalfaoglu, E., Erdogan, B., Kalkan, S., & Alatan, A. A. (2020). Image-based construction of building energy models using computer vision. *Automation in Construction*, 116, Article 103231. [10.1016/j.autcon.2020.103231](https://doi.org/10.1016/j.autcon.2020.103231)
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- Book Chapter
- Iseri, O. K., & Dino, I. G. (2022). Building Archetype Characterization using K-means Clustering in Urban Building Energy Models. In *Computer-Aided Architectural Design: Design Imperatives: The Future is Now*. [10.1007/978-981-19-1280-1_14](https://doi.org/10.1007/978-981-19-1280-1_14)
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- Conference Proceeding UBEM, AI/ML
- Canlı, I., UÇAR, Ş., Gursoy, F. E., Halacli, E. G., Iseri, O. K., Yavuz, F., Dino, I. G., Kalkan, Sinan. (2024). *Transfer Learning-Based Prediction of Heating Energy Consumption Using Urban Building Energy Models (UBEM)* . 31st International Workshop on Intelligent Computing in Engineering, EG-ICE 2024 (pp.580-589). Vigo, Spain
 - Halacli, E. G., Canlı, U., Iseri, O. K., Yavuz, F., Akgul, C. M., Kalkan, S., & Dino, I. G. (2023). A Novel Graph Neural Network for Zone-level Urban-scale Building Energy Use Estimation. In *Proceedings of the 10th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation* (pp. 169–176). Association for Computing Machinery.
 - Duran, A., Iseri, O. K., Akgul, C., Kalkan, S., & Gursel Dino, I., (2022). *Compiling Open Datasets to Improve Urban Building Energy Models with Occupancy and Layout Data* . Conference of the Association for ComputerAided Architectural Design Research in Asia (CAADRIA) 2022 (pp.669-678). Sydney, Australia.
 - Iseri, O. K., & Dino, I. G. (2020). An Algorithm for Efficient Urban Building Energy Modeling and Simulation. SIMAUD - Symposium on Simulation in Architecture and Urban Design. Vienna, Austria.
 - Iseri, O.K., Dino, I. G. (2022). Building Archetype Characterization Using K-Means Clustering in Urban Building Energy Models. *Computer-Aided Architectural Design. Design Imperatives: The Future is Now. CAAD Futures 2021*. Singapore. https://doi.org/10.1007/978-981-19-1280-1_14
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- Conference Proceeding BEM, AI/ML
- Canlı, I., Iseri, O. K., & Dino, I. G. (2021). *Comparison of Different Data-Driven Models on Prediction of Useful Daylight Illuminance (UDI)*. EasyChair.
 - Iseri, O. K., Akin, S., & Dino, I. G. (2020). Energy Demand Prediction For Residential Buildings At Different Climate Conditions Based On Different Data-driven Models. *Bausim 2020, TUGraz*, 647–654.
 - Akin, S., Iseri, O. K., Erdogan, B., & Gursel Dino, I., (2020). *An exploratory multi-objective retrofit decision-making process* . International Symposium of Architecture, Technology and Innovation (ATI) (pp.1-10). İzmir, Turkey
 - Akin, S., Iseri, O. K., Akgul, C., Erdogan, B., & Gursel Dino, I., (2020). *Climate Change Impact on Multi-Objective Optimization: A Case Study on Educational Buildings*. The Symposium on Simulation for Architecture and Urban Design (SimAUD), Vienna, Austria
 - Iseri, O. K., & Dursun, O. (2020). The comparative study on the influence of early architectural design decisions on energy demand: A case study in Turkey. In *Proceedings of the International Symposium of Architecture, Technology and Innovation (ATI)*. Izmir, Turkey.
 - Kalfaoglu, E., Gursel Dino, I., Iseri, O. K., Akin, S., Sari, A. E., Erdogan, B., Kalkan, S., Alatan, A. A. (2020). Vision-Based Lighting State Detection and Curtain Openness Ratio Prediction. The Symposium on Simulation for Architecture and Urban Design (SimAUD), Vienna, Austria.
 - Gursel Dino, I., Sari, A. E., Kalfaoglu, E., Akin, S., Iseri, O. K., Kalkan, S., Alatan, A. A.(2019). *Automated building energy modeling for existing buildings using computer vision* . CIB W78: Conference: Advances in ICT in Design, Construction and Management in Architecture, Engineering, Construction and Operations (AECO), Newcastle-Upon-Tyne, United Kingdom.
 - Gursel Dino, I., Kalfaoglu, E., Sari, A. E., Akin, S., Iseri, O. K., Alatan, A. A., Kalkan, S.(2019). Video Content Analysis-Based Detection of Occupant Presence for Building Energy Modelling . CIB W78: Conference: Advances in ICT in Design, Construction and Management in Architecture, Engineering, Construction and Operations (AECO), Newcastle-Upon-Tyne, United Kingdom.
 - Uyduran, H. G., Iseri, O. K., Üstünes, Y., & Dursun, O. (2016). Optimizing wall insulation material parameters in renovation projects using NSGA-II. *2016 IEEE Congress on Evolutionary Computation (CEC)*, 4208–4213.

Awards

Conference Proceeding

Best Student Paper at SIMAUD: Iseri, O. K., & Dino, I. G. (2020). An Algorithm for Efficient Urban Building Energy Modeling and Simulation. In *Proceedings of the 11th Annual Symposium on Simulation for Architecture and Urban Design* (Art. No. 52).

Young Caadria Award: Duran, A., Iseri, O. K., Akgül, C. M., Kalkan, S., & Dino, İ. G. (2022). Compiling Open Datasets to Improve Urban Building Energy Models with Occupancy and Layout Data. In *Proceedings of the POST-CARBON, CAADRIA 2022*