Meltem Sahin Ozkoc

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Education

Carnegie Mellon University — Pittsburgh, PA
PhD student, Building Performance & Diagnostics — Aug 2026 – Present
Research direction: Multimodal representation learning from sparse, partially observed building data for building understanding and retrofit reasoning
Current coursework: 11-777 Multimodal Machine Learning, 11-785 Deep Learning

Carnegie Mellon University — Pittsburgh, PA
Master of Science, Building Performance & Diagnostics; GPA: 4.10/4.33 — Aug 2024 – May 2026
Fulbright Scholar, CMU SoA Merit Scholar, Master's Thesis Project Graduation Award.
Thesis: *From Pixels to People: Multimodal Building-Stock Characterization for Data-driven Retrofit Targeting*
Selected coursework: 10-601 Machine Learning, 17-634/644 Applied Machine/Deep Learning, 10-623 Generative AI, 16-824 Visual Learning & Recognition (audit), 48-722 Building Performance Modeling, 48-721 Building Controls & Diagnostics, 48-798 HVAC & Passive Systems for Low-Carbon Buildings, 48-781 Geospatial Analytics in Infrastructure Planning

Technical University of Munich — Munich, Germany
Graduate Studies, MS. Information Technologies for the Built Environment — Aug 2023 – Aug 2024
TEV-DAAD Scholar
Coursework: BIM; digital twins; software engineering; GIS; photogrammetry & remote sensing; IoT

Middle East Technical University — Ankara, Turkiye
B.Arch., Architecture; GPA: 3.89/4.00 - Salutatorian (2nd) — Aug 2018 – Jun 2023
METU First 500 Scholarship, OMIM Scholarship, The Architect Kerem Turker Foundation Merit Scholarship

Skills & Interests

Programming & ML: Python, PyTorch, NumPy, Pandas, scikit-learn, Git, Weights & Biases
Methods: deep learning, multimodal learning, computer vision, transfer learning, vision-language models, representation learning, retrieval-augmented generation, time-series analysis, feature engineering, model evaluation
Spatial data: ArcGIS Pro, QGIS, LiDAR, APIs
Building systems: Rhino/Grasshopper, Revit, BIM/IFC, EnergyPlus, IES-VE, Climate Studio, Power BI
Interests: Competitive volleyball, beach volleyball (national team), tennis, specialty coffee, music

Experience

Carnegie Mellon University — Pittsburgh, PA
Research Assistant, Center for Building Performance & Diagnostics — Aug 2024 – Present
- Designed and developed a multimodal Python framework linking property records, permits, drone and street-view imagery, and electricity time series for building characterization and retrofit screening.
- Modeled an LOD2 3D neighborhood using LiDAR point clouds and GIS-based data processing.
- Developed a footprint-based auto-cropping algorithm and computer vision workflows for snow retention analysis from aerial roof crops.

Kohn Pedersen Fox (KPF) — New York, NY
Environmental Performance R&D Intern, Design Technology Team — May 2026 – Jul 2026
- Developed a computer-vision approach to classify curtain-wall panels and extract window-to-wall ratios from BIM models.
- Automated multi-zone and multi-scenario EnergyPlus energy modeling for high-rise and mixed-use early-design massings.

SmithGroup — Pittsburgh, PA
Performance & Analytics Intern, IMPACT Team — May 2025 – Aug 2025
- Automated daylight and energy-analysis workflows with Python, Grasshopper, Ladybug Tools, and Climate Studio for healthcare and mission-critical projects.
- Built a Python workflow around the IES VE API for AIA 2030 reporting, reducing repetitive manual work and improving submission consistency.

Arcelik Global Inc. Istanbul, Turkiye
R&D Project Assistant, Technology Management & System Development Team Jun 2022 – Nov 2022

- Designed and advanced a smart-home energy-management concept with engineering, design, and business teams; translated user scenarios into dashboard prototypes and product requirements.

Projects

RetFormer – *Retrieval-Augmented Document Understanding* Spring 2026
Multimodal RAG, vision-language models, long-document retrieval, grounding

- Built retriever pipelines, embedding precomputation, grounding masks, long-document datasets, and attention-map evaluation for RetFormer, a 23M-parameter bridge between frozen ColQwen retrievers and Qwen-VL readers; evaluated long-document QA and patch-level evidence localization. (project page)

Building Controls & Diagnostics – *Intelligent Workplace AHU* Spring 2026
Facility condition assessment, functional performance testing, BAS analytics, control-sequence modeling

- Analyzed a BAS dataset of 8,784 hourly records and 42 AHU signals and modeled a control sequence integrating ASHRAE 62.1 minimum ventilation, variable-speed fan control, natural ventilation, and unoccupied setback that projected 90.5% annual fan-energy savings. (project page)

Gresham Smith Innovation Hackathon - *Data Centers* Spring 2026
2nd place, data center site selection & feasibility analysis

- Built a transparent data-center site-selection tool that scores 3,234 U.S. counties across 11 infrastructure, sustainability, and economic criteria and exposes hard thresholds and user-adjustable weights in an interactive map, teaming up with CMU civil engineering students and Gresham Smith engineers (news)

Deep Learning Facade Classification Spring 2025
PyTorch, transfer learning, geographic generalization

- Trained ResNet50 and InceptionV3 transfer-learning classifiers for exterior cladding materials on a London street-view dataset and evaluated transfer to a Scotland subset (github)

LiDAR Point Clouds to LOD2 Roof and Solar Models Fall 2024
ArcGIS, raster analysis, external APIs

- Developed 3D urban-building and roof-analysis workflows from LiDAR and raster data to support solar-potential and community-solar planning in Pittsburgh (project page)

BLUE-PRINT-GREEN-DESIGN Fall 2024
Python standard library, MVC desktop application

- Built a desktop application for drawing simple plans, calculating site EUI and component heat loss, and visualizing early-design energy results using only the Python standard library, with no third-party dependencies (github)

Awards & Honors

Master's Thesis Project Graduation Award, Carnegie Mellon University (news) 2026
Fulbright Scholarship, U.S. Department of State 2024–2026
CMU SoA Merit Scholarship, Carnegie Mellon University 2024–2026
TEV-DAAD Scholarship, German Academic Exchange Service 2023–2024
2nd Place, Gresham Smith Innovation Hackathon, Gresham Smith (news) 2026
3rd Place, MIT Climate & Energy Hackathon, MIT Energy & Climate Club (MITEC) (news) 2025

Teaching Experience

Carnegie Mellon University Pittsburgh, PA
Teaching Assistant, Environmental Systems & Energy *(Prof. Vivian Loftness)* Fall 2025

- Held lab sessions to support 15 graduate students in heat flow analysis, passive design, thermal comfort, climate analysis, and retrofit strategy development.
- Graded assignments, provided detailed feedback on consultant energy reports, refined course materials.