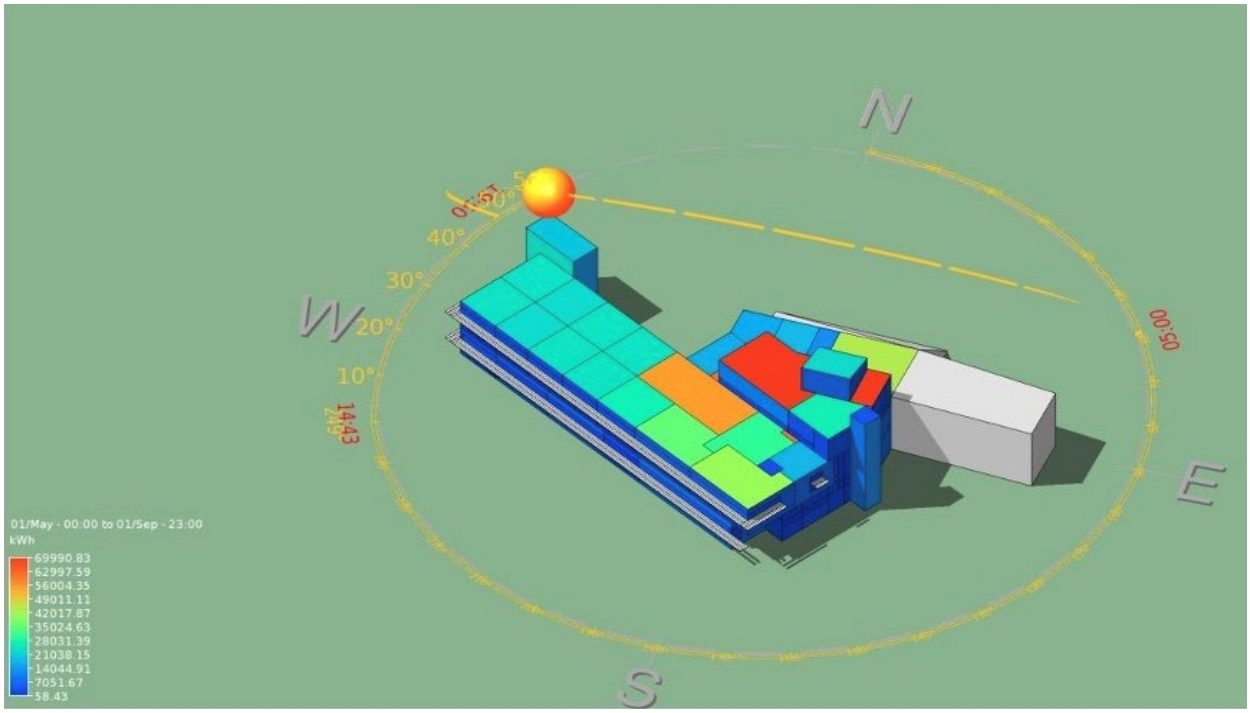
School of Architecture
College of Fine Arts, CFA 201
Carnegie Mellon University
Pittsburgh, PA 15213



A bird-eye view of the whole-building energy simulation model of Center for Sustainable Landscape of Phipps Conservatory by ISE VE.

48-524/722: Building Performance Modeling
Units: 9-12
Instructor: Wei Liang, P.E.

The Building Performance Modeling course focuses on conceptual foundations and practical applications of advanced and integrated whole-building energy simulation programs with an emphasis on architectural building envelope systems, mechanical electrical building systems and controls, and on-site renewable energy systems. Students are engaged in project-based collaborative studies with an emphasis on analytical methods of simulation-aided high-performance building design. Theoretical lectures and software demonstrations are supported with discussions of relevant building case studies and particular design solutions which exhibit an innovative character with the application of whole-building energy simulations in the evaluation and improvement of the total building performance starting from the early stages of design development. The BPM course has the goal of introducing the use of state-of-the-art whole-building energy simulation tools (e.g. Autodesk Conceptual Energy Analyzer (CEA), IESVE, and Design Builder/EnergyPlus). Simulation tool introductions are carefully synthesized with introductions to theoretical foundations of performance modeling and analytical approaches with emphasis on data visualization techniques for enhanced inter-disciplinary design decision-making. Selected energy performance assessment techniques are demonstrated along with the introductions of contemporary design approaches for environmentally responsive, energy efficient, and healthy buildings.