



SOLAR DECATHLON

2007 Solar Decathlon Citations from Select Technical Publications

Changing Behaviors: Market Transformation Web Sites as Online Narrative

Hicks, D. *Panel 6 – Market Transformation: Taking Efficiency Mainstream. Proceedings; 2008 ACEEE Summer Study on Energy Efficiency in Buildings, August 17-22, 2008, Pacific Grove, CA.* Washington, DC: American Council for an Energy-Efficient Economy (ACE3); pp. 6.86-6.97.

Simulation and Preliminary Results Of An All Electric Net-Zero Energy Solar Home

Barnes, B.; Martinez, L. A.; Efram, T.; Chapman, P.L.; Newell, T.A. Design, *Session: 21-1 Advances in Zero Net Energy & Solar Buildings, ASME Energy Sustainability 2008 Conference, August 10-14, 2008, Jacksonville, FL.* ASME Conference Proceedings ES2008-54327.

This paper describes the mechanical systems, the DC-coupled electrical system, the simulation approach and the preliminary results of the University of Illinois entry in the 2007 Department of Energy Solar Decathlon competition.

Modeling and Validation of Building Thermal Performance of the 2007 Santa Clara University Solar Decathlon House

Lebassi, B.; Gonzalez, J.; Elizondo, H. *Session: 21-1 Advances in Zero Net Energy & Solar Buildings, ASME Energy Sustainability 2008 Conference, August 10-14, 2008, Jacksonville, FL.* ASME Conference Proceedings ES2008-54044.

This research includes analysis of the Santa Clara University Solar Decathlon solar house energy and thermal performances.

Work in progress — Multidisciplinary laboratory for development, design and consumer testing of marketable residential LED luminaires

Means, J.K.; Anneberg, L.; Snyder, C.; Feng, J. (October 2007)
Presented at the Frontiers in Education Conference—global engineering: knowledge without borders, opportunities without passports.

Electrical engineers and architects collaborate in 'real life'. In the university, this rarely happens. This paper presents novel approaches to a laboratory that brings electrical engineering and architecture students together. Lawrence Technological University is participating in the 'Solar Decathlon 2007' international competition. Lighting is a critical part of this competition and 'lighting energy use' is one of the ten competitions. The designed house will have varying lighting requirements, and innovative energy conserving lighting approaches are required. The LTU laboratory facility will eventually have several stations known collectively as 'The Lighting Lab'. Electrical engineering students work on the technical aspects of light measurement and the design and manufacturing of luminaires, whereas architecture students work on designing esthetically pleasing lighting luminaires that meet the illumination requirements. Equipment in the lab includes various luminaries, lamps, an artificial sky fixture, a direct beam sunlight simulator, light meters and demonstration displays. Students become familiar with direct/indirect





light sources and conventional and low-voltage lighting, and then develop how it can be used for task, decorative and general lighting. A focus for research is the study of LEDs [light emitting diodes]. LED luminaries require further development to provide required illumination at work surfaces in an esthetically pleasing way.

<http://ieeexplore.ieee.org/iel5/4417794/4417795/04418183.pdf?isnumber=4417795&prod=STD&arnumber=4418183&arnumber=4418183&arSt=F2C-13&ared=F2C-14&arAuthor=Means%2C+J.K.%3B+Anneberg%2C+L.%3B+Snyder%2C+C.%3B+Jin+Feng>

Simulation Enhanced Prototyping of an Experimental Solar House

Choudhary R, Augenbroe G., Gentry R, and Hu H. (August 2007)

Proceedings: Building Simulation 2007

Presented at the 10th International Building Performance Simulation Association Conference and Exhibition, Beijing, China.

This paper reports the design analysis process undertaken by the Georgia Tech Solar Decathlon 2007 team for an 800-square-foot solar-powered house. It presents the simulation process engaged over the entire design development cycle of the house (from conceptual to built), and demonstrates why, when, and how particular tools were deployed or developed on the basis of queries coming from diverse design team over several design iterations. Through this project, the paper purports a need-based and tool-independent analysis process that not only supports design from its conceptual development to incremental evaluations, but is also usable for final testing and fine-tuning of building components as they are brought on site, as well for optimal control of energy management when the house is fully operational.

http://gundog.lbl.gov/dirpubs2/BS07/eplus_688.pdf



bp



Solar Decathlon as a trigger to next-generation design education

Fisk III, P.

[Video recording: DVD; ca. 237 min.]

Las Vegas, NV: UNLV School of Architecture, 2007.

Pliny Fisk III explains the theory and practice of making the solar decathlon more than just an exercise but instead as a trigger that could change how we conceive of architectural educations and its responsibilities both to the student and to the profession. Every facet of design from material systems, building systems, international standards, renewable energy, biophilia, regionalism, as well as social and environmental responsibility are all wrapped up in a competition that for most part is looked at as an expensive exercise that will never go beyond a game for Washington bureaucrats. The workshop is an in-depth show-and-tell interactive presentation including never-before presented advanced materials and solar technologies, flexible and collapsible building systems, biophilia, next-generation life cycle design, disaster and fast deployment housing, and a grow community approach to development as an alternative to New Urbanism. Each of these topics in themselves represents a virtual revolution in how we design, how we practice, and how we educate.



Articles About Solar Decathlon From Peer-Reviewed Journals

Solar Decathlon stars sustainable designs.

Lubick, Naomi

Environmental Science & Technology, v. 41, n. 24, December 15 2007, p8209

The article highlights the third Solar Decathlon that was held in October 2007 on the National Mall in Washington D. C.

<http://pubs.acs.org/subscribe/journals/esthag/41/i24/html/121507news4.html>

Solar Decathlon Energizes Young Engineers On Renewable Resource.

ASHRAE Journal, Nov 2007 Supplement, Vol. 22 Issue 11, p1

This article offers news and notes pertaining to the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE). In particular, the article focuses on the 2007 Solar Decathlon which helped to educate student engineers and student members of the society on renewable resources. An overview of the event, which was held October 12-20, 2007, is provided. The event consisted of teams competing to build and design an attractive and energy-efficient solar-powered house. Commentary regarding the event from ASHRAE president Kent Peterson is included.

<http://search.ebscohost.com/login.aspx?direct=true&db=aph&AN=27507035&site=ehost-live>



bp



University teams limber up for Solar Decathlon

Refocus, Sep/Oct 2007, v. 8 n. 5, p13

[doi:10.1016/S1471-0846\(07\)70134-8](https://doi.org/10.1016/S1471-0846(07)70134-8)

Additional Articles About Solar Decathlon

Cheap Labor

Dijusto, P. *Popular Science*, v.273 n.3, September 2008. p.38

College students are coming into their own as designers and innovators courtesy of a series of competitions aimed especially at them. Unlike prize-driven contests such as the Virgin Earth Challenge or the Progressive Automotive X Prize, student contests often offer little more than self-satisfaction or a trophy as the reward, but they have nevertheless inspired many undergraduates to come up with new solutions to difficult problems. The annual EcoCAR challenge, the International Genetically Engineered Machine Competition, the Solar Decathlon, and the Hydrogen Student Design Competition are 4 examples of collegiate competitions that ask much and pay little.

Learning to Live on Alternative Energy

Sokol, D. *Architectural Record*, vol.196, n.3, March 2008, p.48



The article discusses architectural projects that use sustainable designs. The Near North Apartments complex uses a wind turbine system designed by industrial designer Bil Becker. The Solar Decathlon House in Washington, D.C., is a structure powered entirely by photovoltaic (PV) cells. An office building under construction in New York City will utilize a combined heat and power (CHP) system.

<http://continuingeducation.construction.com/article.php?L=5&C=393&P=3>

Published Theses

System for Intelligent Control of the Environment [I.C.E.-Sys]

Hernandez, W.; Nguyen, T-L; Polk, D; Randhawa, P.; Thakur, R.
Senior Design Project – School of Engineering, Santa Clara University
March 6, 2008

<https://www.scu.edu/engineering/cse/ugrad/upload/COEN-2007-PROJECT-10.pdf>

Numerical Simulation of 3-D Turbulent Room Airflow Pattern and Temperature Field in UC Solar Decathlon House

Rojatkar, P. (2007)

M.S. Thesis. Cincinnati, OH: University of Cincinnati.

<http://www.ohiolink.edu/etd/send-pdf.cgi/ROJATKAR%20PRACHI.pdf?ucin1196019483>

Real-Time Adaptive Systems for Building Envelopes

Deo, V. (2007).

M.S. Thesis. Atlanta, GA: Georgia Institute of Technology.

<http://etd.gatech.edu/theses/available/etd-11142007-115710/>

Engineering Design, Construction, Operation and Analysis of the 2007 Texas A&M University Solar Decathlon House

Ramirez, E. J. (2008)

M.S. Thesis, College Station, TX: Texas A&M University.

ESL-TR-08-05-01

<http://repository.tamu.edu/handle/1969.1/55189>



bp

