2017

Synapse: Association of Energy Engineers Presentation

University of Nevada, Las Vegas. Solar Decathlon Team.

Follow this and additional works at: https://digitalscholarship.unlv.edu/sd_2017_marketing

Part of the Environmental Design Commons, and the Sustainability Commons

Repository Citation

This Presentation is brought to you for free and open access by the Solar Decathlon 2017: Sinatra Living at Digital Scholarship@UNLV. It has been accepted for inclusion in Sinatra Living: Marketing and Promotion by an authorized administrator of Digital Scholarship@UNLV. For more information, please contact digitalscholarship@unlv.edu.
solar decathlon 2017
Where to begin

What is the Solar Decathlon?

The U.S. Department of Energy Solar Decathlon showcases innovative solar powered houses that are designed, built, and operated by collegiate teams. The winner of the competition is the team that best blends technology, market potential, and design excellence with smart energy production and maximum efficiency.
What is the Solar Decathlon?

design

The design must be formed to innovatively combine knowledge from multiple disciplines, in order to address the market and competition objectives.

build

The next challenge begins with reinforcing design intent with physical form. Taking into consideration building tolerances as well as structural viability, form and function marry.

transport

Moving on, the design and building of the project must now consider moving to. The built home must also incorporate mobile capability as part of the final objective.

compete

Team Las Vegas will compete against 16 teams, all with the same objective, to win. This time all sixteen houses will find a sense of place in Denver, Colorado.
What is the Solar Decathlon?

- architecture
- engineering
- market potential
- communications
- innovation
- water
- health & comfort
- appliances
- home life
- energy
In the past...

What is the Solar Decathlon?
Quick Facts:
Currently Resides at the Springs Preserve
Quick Facts:
- 2013: 2nd Place Internationally
- 1st Place Market Appeal
- 2nd Place Communications
- 3rd Place Architecture
solar decathlon 2017 + Team Las Vegas
Interior environments constitute a multi-sensory experience from which the brain acquires and uses new and retained information to direct behaviors (Albright, Salk Institute, 2009)
90% of what we experience everyday is the designed environment.
A person on average will spend 90% of their life in the interior environment.
The need for neuroscience-informed design strategies is especially evident in states such as Nevada, where the senior citizen population grew more than 50% over the past decade and expected to make up one fourth of the state’s population by the year 2030.
2017 conceptual design
1. AGING
2. AUTOMATION
3. ENERGY
1 Age-in-Place

1 facilitating orientation Priming the user with appropriate visibility through fenestrations of the building is a primary component to facilitate orientation.

2 autonomy The project allows for autonomy in spaces where mobility may be most difficult for an older person, such as the kitchen, bath, and living space.

3 intellectual + sensory-stimulation The design provides spaces for multipurpose activities and consequently a sense of novelty and variety throughout the day. It is a high priority to create variety in multipurpose spaces, as it is a form of intellectual and sensory stimulation.

4 providing a safe and secure environment The interior environment is nested within a sequence of transparent and opaque partitions to create a comfortable enclosure for privacy and security. These partitions are rhythmic in material to allow for transparency and privacy.

5 balance between private and social spaces The home is divided into social and private modules. Both modules allow for generous outdoor exposure and semi-visibility to the adjacent spaces to retain way-finding abilities.

Principles of aging-in-place design

The design of the interior environment and architecture consists of several principles in which evidence-based design research comes to fruition. Environments which integrate proper orientation for the user, behave autonomously in daily activities, provide intellectual and sensory stimulation, security, and balance private and social spaces are ideal for the aging individual. These principles create interior environments for true independent living and successful aging.

01 master security system
- centralized hub for smart lock control

02 automated smart locks
- added security
- ease of nightly lock up

03 learning thermostat
- central location
- adjusts to users patterns

04 floor/roof sensors
- sense occupant activity
- fall detection

05 health monitoring
- blood pressure
- blood sugar

06 smart TV
- family communication
- control center

07 smart appliances
- energy savings
- communicate with home

08 sleep monitoring
- track respiration and sleep cycles
3 Energy
Project Process

Redundancy
Project Process

Integrated Mechanical Unit
2013 Module Chassis

- Custom manufactured
- High cost, heavy steel
- Irregular shape
2017 Chassis Option

- Pre-manufactured mobile-home chassis
- Low Cost
- 1 week production, 1 week shipping
- Appeals to homebuilders
Project Process

Modules
2017 Concept
Social Space
2017 Concept
Dining Space
Community Outreach

- Las Ventanas Retirement Community
- Lou Ruvo Center for Brain Health
- Osher Lifelong Learning Institute
Community Outreach

- Las Ventanas Retirement Community
- Lou Ruvo Center for Brain Health
- Osher Lifelong Learning Institute
Community Outreach
Q+A