The Bridge between Modernism, Judaism and Sustainability: 
Temple Mount Sinai, El Paso, Texas (1962)

Anat Geva, PhD; Department of Architecture
Presented at SESAH Conference, 2019

"And I will lift up mine eyes unto the mountains" (Psalms 121:1)

Sidney Eisenshtat, a Los Angeles based architect designed several synagogues and other Jewish institutions during 1950s-1960s that influenced the design of synagogues in California and the west coast. His design concepts, which highlighted the region’s culture and environment became Eisenshtat’s signature contribution and were culminated in his design of Temple Mount Sinai in El Paso, Texas (1962).

The paper analyzes this synagogue as an example of a bridge between modernism, Judaism, and sustainability. The modern design of this reform synagogue answers the functional and symbolic needs of the Jewish congregation and exhibits Eisenshtat’s modernism and environmental conscious design. His design is a significant contribution to sustainable architecture of houses of worship long before the concept of sustainability became popular. Utilizing concrete Eisenshtat created a mountain in the desert, which reflects the surrounding mountains of El Paso and resembles Mount Sinai, the mountain from where the ten commandments were given to the people of Israel. Some consider the soaring sanctuary as the holy tent reminiscence of the holy Tabernacle of the people of Israel in their journey in the desert.

The paper concludes with the current preservation issues the synagogue faces and illustrate the proposed solutions to save the building and its landscape based on local plants.
Making Room for the River: Applying a Plan Integration for Resilience Scorecard to a Network of Plans in Nijmegen, The Netherlands

Siyu Yu

In this study we analyze plan integration for flood resilience in the city of Nijmegen, the site of the largest Room for the River project in The Netherlands. Little is known about the degree to which local and regional plans are coordinated with the national Room for the River program or about the cumulative influence of plans on flood vulnerability. To effectively investigate these issues, we use and build upon the Plan Integration for Resilience Scorecard (PIRS) concept and method, which analyzes the consistency and effects of networks of plans on community vulnerability. We expand the scope to include plans from multiple administrative scales and the focus to include environmental vulnerability. Using a three-phase evaluation process, we demonstrate that Room for the River policies are well integrated in Nijmegen’s network of plans, particularly with respect to flood safety and natural protection. However, we also find that policies at different administrative scales lack consistency in some places, some socially vulnerable neighborhoods receive comparatively little policy attention, and local plans often prioritize development over flood resilience, though higher tier plans sometimes make up for these policy gaps. Flood resilience is still finding its way in the Dutch planning system.

The PIRS offers planning practitioners a method to assess how networks of plans influence community vulnerability and, as demonstrated in this analysis, to determine the degree to which plans at multiple administrative scales target the most physically, socially, and environmentally vulnerable geographic areas. It can be used to support the ambitious goals of a program like Room for the River and align them with local development priorities.
Chancellor Sharp, while speaking at two separate events, stated his intention that the TAMUS would be the leading university system for human space exploration in the nation.* TAMUS (Vice Chancellor for Research Jon Mogford) and the NASA Johnson Space Center (Center Director Mark Geyer) are creating an annual “Lunar Forum” that will convene this year in College Station. An invitation-only event, the forum will assemble 125 leaders in business and government. In this new era of accelerated human space exploration and commercialization, where research directions and priorities have not been fully defined, an X-grant team will ensure that Texas A&M establishes scientific leadership in this arena. The fundamental and applied scientific knowledge generated by this team will help Texas A&M set the strategic research agenda and priorities at NASA and other government agencies. The Texas A&M Lunar Surface Experiments Program (LSEP) is a highly interdisciplinary research effort that, if funded, will catalyze a larger and sustainable pillar of space science research at Texas A&M University for years to come. With faculty and research staff representing four TAMU Colleges (Engineering, Science, Geosciences, and Architecture), LSEP will address four challenge areas that will enable a permanent human presence on the Moon. The team goals are directly traceable to established NASA and National Research Council Roadmaps (NASA2020, NRC 2011). Specifically, this program will use integrated experimental and computational approaches to:

- Develop and test solar cells for high-efficiency power generation (Theme2), explicitly called out in both roadmaps (NRC 2011, pp. 280; NASA2020, pp.134-137);
- Manufacture construction materials for dust mitigation, landing pads, roads, and habitats from Lunar regolith (Theme4), also described as critical needs in both roadmaps (NRC 2011 pp. 272, 282-284, NASA 2020, pp.200-302);
- Measure and model complex interactions among fluids and solids under the reduced gravity at the Lunar surface (Theme1), described as needed applied science in the NRC roadmap (NRC 2011, pp. 268-272);
- Determine the influence of Lunar dust on the emissivity and absorptivity of thermal radiators (Theme3), as described in the NASA roadmap (NASA 2020, p. 321).
Multi-User and Web-based Parametric Modeling with Multiple Visual Programming Tools

Seda Tuzun Canadinc, Bihan Wang, Yalong Pi, Wei Yan

This paper presents a new framework for Web-based parametric modeling for design collaboration, allowing multiple users to work on the shared Web-based model in the process of building design and modeling, performance simulation, and optimization. The Web-based model viewer displays a shared model. Two visual programming tools: Grasshopper and Dynamo, are used on users' local computers connected to the Web. Two working prototypes of modeling methods were developed to control and modify building models on the Web. Two case studies with three tests each were conducted on a simplified residential building model. In Case Study 1, two simulated users tested the parametric capabilities on transformations including scaling, translation, and rotation of the shared Web-based model using Grasshopper and Dynamo. In Case Study 2, two simulated users collaborated on the shared Web-based model through Grasshopper in the process of optimization for different building performance objectives, in terms of daylight, energy use, and roof coverage. Web-based parametric modeling is expected to provide opportunities for collaboration in parametric design and optimization. Findings and technical limitations of the framework are discussed in the paper.
Human-Centric Sensing Platform to Capture Environmental Distress of Pedestrians from Multimodal Data

Jinwoo Kim

The urban built environments play an important role in the citizen’s quality of life relative to such factors as walkability, mobility, neighborhood revitalization, and economic development of the community. However, traditional evaluation approaches (e.g., neighborhood surveys, field observation, and passively-collected urban data) primarily rely on inherent human subjectivity which cannot sufficiently answer the fundamental inquiry of how urban citizens physically and psychologically respond to the surrounding urban built environments. In this context, this research explores the usability of multimodal data from pedestrians’ physiological signals (e.g., electrodermal activity, gait patterns, and heart rate) and image-based data (e.g., built environment features such as sidewalk connected, road speeds, and sidewalk shades in image) to capture environmental distress of pedestrians. In the experiments conducted in university (n=31), residential (n=30), and commercial area (n=9), participants were requested to walk on a pre-defined path with the wearable devices (e.g., wearable inertial measurement units, a wristband-type wearable device, and a smartphone). Additionally, participants were asked to conduct a survey and interview to provide self-reported scores on negative environmental stimuli (e.g., the presence of broken houses, unstable sidewalk, a replica of a dead animal body, etc.) that existed in their walking path. The statistical results, obtained from physiological signals, demonstrate apparent physiological responses to the negative environmental stimuli, and the combined features from physiological signals and image-based data increase prediction accuracy in the machine learning model. The outcome of this study is expected to provide opportunities for advancing urban built environment assessment, especially in terms of promoting neighborhood walkability and increasing feelings of comfort and satisfaction in the urban space.
BIM + Virtual Reality - Game Design for Human Building Interaction in Architectural Education

Hassan Anifowose

Architectural Education faces limitations due to its tactile approach to learning in classrooms with only 2-D and 3-D tools. At a higher level, coupled with spatial awareness, virtual reality provides a potential for delivering more information to individuals undergoing design learning in Architecture. Compared to existing approaches, the integration of gaming techniques into the experiential learning process improves abilities for critical analysis and abstract conceptualization. COVID-19 has further proven Architectural education’s over-reliance on classroom experiences to be inadequate and adaptation to future demands is long overdue. This research is a pilot study to determine best practices for content creation and remote deployment which is useful for design cases and remote learning in Architectural Education. “With VR/AR in Education, the number of teaching applications is relatively low and their development is challenging - success relies on effective scaffolding and integration of assessment and feedback” (Moteljek et al, 2019). Gamification is the major technique adopted for improving how learners create and interact with design elements with varying levels of development (LODs). Typically, games are created with increasing levels of difficulty. This concept provides the potential for learning about the increasing levels of development in design and building information as a player progresses through the game. A first game level is a building in its most basic conceptual geometric form. The game’s highest level is the same building in its most detailed geometric form with components’ information embedded in it. How much and how well can a player (student or employee in practice) learn about the architectural composition of such a building based on its different levels of development? What are the best game design practices that must be implemented in order to allow for effective learning?

In this ongoing research, a designed user experiment showcases content development with the Unity Game Engine as an extensive tool for teaching varying levels of developments from concept design to final detailed design. Users explore a collaborative virtual environment and embark on design activities based on varying LODs. Participants from the university consisting of Students, Design Professors and other Architects in practice will be invited to test and discuss how their experience and interactions in the virtual world can help content design and implementation of a gamified approach to teaching Architecture. A similar comparison experiment will be developed for Augmented Reality (AR). This will further enable researchers to answer questions as to which alternative between BIM+VR and BIM+AR with respect to interaction and presence contribute to effective learning in design education. More data will be collected and analysed at the post-experiment stage to further explore its application. With this, gamification is expected to make its way into Architectural Education both in the classroom and on the field.

Keywords - BIM, Virtual Reality, Augmented Reality, Unity, Interface Management, Game Design, LOD, Level of Development