RESEARCH ON THE BUILT & VIRTUAL ENVIRONMENTS
Global Symposia Presentations 2004 • College of Architecture • Texas A&M University
A glimpse into the future as imagined in 1930 by architecture professor Gilbert Allan Geist (1880-1937). The drawings on the cover are part of a series of futurescapes created by Geist for the 1930 edition of “Longhorn,” the yearbook published by the senior class of the Agricultural and Mechanical College of Texas (now Texas A&M University).

Geist taught painting, drawing and architecture at Texas A&M from 1910 to 1933. The primary record of his artistry can be found in the yearbooks published during his tenure. After retiring from Texas A&M, he moved to Philadelphia and worked as an architect for the federal government. He died in Philadelphia in 1937 at the age of only 53, and was buried in Muncy, Pennsylvania.

To date, little of his artwork has emerged, but the excellent illustrations and drawings found in the A&M annuals indicate that he was an artist of great skill. A generation of Texas A&M architecture students received their first artistic training under Geist.

Texas’ first formal architecture program was established at Texas A&M almost 100 years ago, on Sept. 1, 1905.
Great colleges take time to emerge.

As we look forward to the Centennial Celebration of Architecture at Texas A&M next year, we reflect on the critical components necessary for a college of architecture to consistently demonstrate greatness. Certain questions emerge. Does the college have a worldwide reach? Does the college have the breadth to include all virtual and built-environment disciplines? Does the college integrate teaching and research? Does the college have a flourishing community of scholars?

Positive answers to these questions can be found at the Texas A&M College of Architecture’s annual symposium, “Research on the Built & Virtual Environments: Global Symposia Presentations.” This special one-day event allows faculty members, graduate students, former students, and interested guests to hear about 40 of almost 300 presentations delivered by college faculty members in 34 different nations around the globe during the past year. The symposium documents the global reach of our faculty’s research and scholarly production; it reinforces our commitment to the integration of teaching and research; it promotes interdisciplinary thinking and practice; and it reinforces the respect our faculty community has for one another as contributing researchers and scholars. The event demonstrates that greatness is attainable through focused, collaborative effort.

We welcome you to Research on the Built & Virtual Environments: Global Symposia Presentations 2004, the sixth annual international symposium featuring presentations made exclusively by faculty members of the College of Architecture. The presentations on today’s program, and those listed in the appendix of this publication, are refereed or invited papers and exhibits presented at scholarly meetings and academic institutions across the nation and around the world during the 2003-2004 academic year.

It is unusual for a college such as ours to take “time out” from our usual schedule of classes, design studios and meetings to hear our colleagues report on their current research. Too often, faculty colleagues and graduate students are left at home when one of us travels to a distant symposium to deliver the latest in our thinking on a timely topic. It is fitting in our role as the largest college of our kind in the nation to establish new traditions, such as this one, that couple scholarly research solidly with professional education. One organizing principle of the College of Architecture is the influence of research on teaching. This annual symposium is a catalyst for the research-informed teaching in all of our 12 degree programs. The presentations you will hear today reflect the range and depth of research and scholarly work currently under way in our college.

Four concurrent presentation sessions will focus on topics as diverse as health facilities design, hazards mitigation, visual arts, urban planning, energy, construction, and architectural theory. Regardless of the nature of your fascination with the built and virtual environments, this symposium includes a presentation that you will find of interest. At the end of this publication, you will find a list of all presentations made last year by college faculty, along with brief descriptions of the college’s research centers and labs.

In addition to faculty presentations, this year’s symposium features a keynote address by Dr. Morad A. Atif, director of the Indoor Environment Research Program for Canada’s National Research Council-Institute for Research in Construction. His presentation is entitled, “Extending Building-Related Research to Application: Challenges and Success Stories.”

Like our last five very successful faculty symposia, this year’s event will showcase the international influence of our faculty on the knowledge base of their respective disciplines. The event is yet another effort by the college to positively influence the built and virtual environments of Texas and the world.

Regards,

Tom Regan
Dean
Firmitas, Utilitas & Venustas

The individual sessions at this year’s symposium were organized based on the intersection of the College of Architecture’s most recent redefinition with one of the oldest written definitions of architecture. The academic core of the college has been reconceptualized as reflecting the principles of sustainability, health and visualization. The Vitruvian troika of Firmitas, Utilitas and Venustas are routinely translated as “Firmness,” “Commodity” and “Delight.” In this context they might be more appropriately translated as “Durability,” “Convenience,” and “Grace.”

8:00 ▶ Continental Breakfast & Registration: Second Floor Atrium, Langford Building A
8:30 ▶ Welcome: Dean J. Thomas Regan, Langford C105

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<td>Moderator: Peacock</td>
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<td>■ Land Titling: Issues of Land Tenure in Low Income Communities: A Case Study</td>
<td>■ Financial Effects of Reverse Auction Bidding on Telecommunications Contractors</td>
<td>■ Skateboarding in Sarajevo</td>
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<td>9:10 ▶ Brody, Samuel D.</td>
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<td>■ Conflict on the Coast: Using Geographic Information Systems to Map Potential Environmental Disputes in Matagorda Bay, Texas</td>
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<td>9:35 ▶ Sharkawy, M. Atef</td>
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<td>■ Are Healthy Communities Profitable?</td>
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<td>10:00 ▶ Jourdan, Dawn</td>
<td>Nichols, John M.</td>
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<td>■ Mending Fences: Resolving Neighbor Disputes with Squatter Settlements in Belize</td>
<td>■ Development and Calibration of an Earthquake Fatality Function</td>
<td>■ The Role of Creativity in the Future</td>
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<td>10:25 ▶ Abrams, Robin F.</td>
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<td>■ Lucy’s Feat: Frederick Law Olmsted’s Journey Through Texas</td>
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<td>■ Philosophy in the Flesh: Embodied Realism and Significant Form</td>
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<td>■ Hurricane Risk Perceptions Among Florida’s Single Family Homeowners</td>
<td>■ The Survey &amp; Documentation of Pointe-du-Hoc Historic Battlefield, Normandy, France</td>
<td>■ Assessing the Influence of Diversity on Design</td>
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<td>11:15 ▶ Rogers, George O.</td>
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Continental Breakfast & Registration: Second Floor Atrium, Langford Building A
Welcome: Dean J. Thomas Regan, Langford C105
### Keynote to focus on multidisciplinary research in sustainability, conservation and healthy design

Morad R. Atif, an internationally acclaimed expert on multidisciplinary research in sustainability, conservation and healthy building design and construction, will deliver the keynote address at the Texas A&M College of Architecture’s sixth annual faculty research symposium, “Research on the Built and Virtual Environments: Global Symposia Presentations 2004.” The daylong event, which features a series of faculty presentations previously delivered at scholarly venues around the world, will be held Friday, Oct. 29 at the Langford Architecture Center on the Texas A&M campus.

Atif is director of the Indoor Environment Research Program for Canada’s National Research Council-Institute for Research in Construction (NRC-IRC). His keynote presentation, tentatively titled “Extending Building-Related Research to Application: Challenges and Success Stories,” will focus on the NRC’s research and development mandate as it relates to health, well-being, safety, productivity and sustainability. His talk will highlight successful NRC-IRC projects involving innovative collaboration with academia.

As director of the Indoor Environment Research Program, Atif oversees initiatives aimed at delivering:

**See KEYNOTE, Page 27**

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### Schedule

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<td>1:30</td>
<td>Keynote Address: Dr. Morad R. Atif (See article at top of this page), Langford C105</td>
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#### VISUALIZATION

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<td>2:15</td>
<td>Kang, J.H.</td>
<td>XML-Based Vector Graphics: Application for Web-Based Design Automation</td>
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<td>2:40</td>
<td>Haque, M.E.</td>
<td>A Computer Simulation Model for Emergency Building Evacuation with ARENA</td>
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<td>3:05</td>
<td>House, D.H.</td>
<td>Model-Based Motion Filtering for Improving Arm Gesture Recognition Performance</td>
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<td>3:30</td>
<td>Parke, F.I.</td>
<td>Facial Animation: History and Applications</td>
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<td>3:55</td>
<td>Johnson, R.E.</td>
<td>Digital Innovation and Organizational Change in Design Practice</td>
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#### HEALTH

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<td>Srinivasan, V.</td>
<td>Column Modeling</td>
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<td>Vasquez de Velasco, G.</td>
<td>Changing the Culture of Design Studio Reviews: The Use of Large Format Interactive Plasma Screens in Design Studio Reviews</td>
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<td>3:05</td>
<td>Haberi, J.S.</td>
<td>Demonstration of the use of Multimedia Electronic Information Enhancements for a Chapter Handbook CD-ROM Overview (1017-RP)</td>
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<td>3:55</td>
<td>Shepley, M.</td>
<td>Evidence-Based Design for Infants and Staff in the Neonatal Intensive Care Unit.</td>
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#### Keynote Address:

Dr. Morad R. Atif

**Extending Building-Related Research to Application: Challenges and Success Stories**

- **Abstract:**
  - Multidisciplinary research in sustainability, conservation and healthy building design and construction.
  - Challenges and success stories involving innovative collaboration with academia.

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**Recommended Reading:**

- Morad R. Atif, an internationally acclaimed expert on multidisciplinary research in sustainability, conservation and healthy building design and construction.
- Keynote presentation tentatively titled “Extending Building-Related Research to Application: Challenges and Success Stories.”
- Focus on health, well-being, safety, productivity and sustainability.
- Highlight of successful NRC-IRC projects.

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**See KEYNOTE, Page 27**
Colonias are impoverished, unincorporated and relatively undeveloped villages sprinkled in clumps near population centers along the U.S.-Mexico border. Studies estimate there are about 1800 colonias in Texas with an official population of approximately 356,000 people.

Conflict on the Coast: Using Geographic Information Systems to Map Potential Environmental Disputes in Matagorda Bay, Texas

The sustainable management of coastal natural resources inevitably involves identifying stakeholder conflicts and developing planning processes which prevent these conflicts from becoming intractable disputes. This study links environmental conflict to specific areas within a large ecological system.

Specifically, we use Geographic Information Systems (GIS) to map potentially competing stakeholder values associated with establishing protected areas in Matagorda Bay, Texas. By overlaying multiple values associated with a range of stakeholders across space, we are able to identify hotspots of potential conflict as well as areas of opportunity for maximizing joint gains.

Mapping stakeholder conflict is an approach to proactively locate potential controversy in response to development plans.
Development would generate the prohibition of coastal structural uses would produce the greatest degree of conflict on or near-shore, particularly at the mouth of the Colorado River.

to a specific environmental management proposal and guide decision makers in crafting planning processes that mitigate the possibility of intractable disputes and facilitate the implementation of sustainable coastal policies. Results indicate that under different management scenarios, protected area proposals will generate more conflict in specific areas. Most notably, regulated uses would produce the greatest degree of conflict on or near-shore, particularly at the mouth of the Colorado River.

Additionally, of all the management scenarios evaluated, the prohibition of coastal structural development would generate the overall highest level of conflict within the bay. Based on the results, we discuss the policy implications for environmental managers and provide guidance for future research on location-based conflict management within the coastal margin.

Are Healthy Communities Profitable?

This presentation addressed the financial feasibility aspect of healthy communities in the 1994 International Symposium organized by Texas A&M and Tsinghua Universities and held in Beijing, China. The paper begins with identifying the focus of land and real estate development as analysis of both site and market-place, guided by creative synthesis of both design concept and venture structure. The paper proceeds with three premises:

1. That a “healthy community,” defined as one with healthy individuals, and a healthy environment that is socially and financially healthy, require “green space-centered” planning and design.

2. That “green space,” as the key design concept in “healthy communities,” is the same as in Howard’s 1950s “Garden City,” Olmsted’s 1960s “Park Movement,” Bellamy’s 1900s “City Beautiful,” Church’s 1970s “Cluster Developments,” and Arendt’s 1980s “Green Development.”

3. Real estate values are positively linked to proximity to green space.

The paper proceeds to identify three sets of requirements to ensure feasibility/profitability of “healthy communities”:

- Facility program should be based on thorough market segmentation and consumer profiling, as a basis for determining product mix and health-related amenities.
- “Green Space” should be carefully structured as a hierarchy of green corridors to ensure environmental health while maximizing green space frontage.
- The business venture should be structured as a public-private partnership (co-development) to ensure social health while improving project feasibility/profitability.

The presentation summarizes a number of studies that show the positive correlation between green space and real estate values, and utilizes a number of case studies to show how planning/design of the pattern/structure of “Green Space” increases such values.

Presented at the 2003 International Symposium on Healthy Community Initiative in China, Tsinghua University, Beijing, China, May 2004.

Continued on next page
public interest is. One of the primary mechanisms planners employ to discover the public interest is by deliberating with diverse groups of stakeholders about their positions on the issues in controversy. Such conversations are not likely to yield clear cut responses in the way that a survey or scientific study might. However, these conversations between planners and stakeholders often yield a richer understanding of the context of existing controversies.

This paper will describe how a planning process may be defined and potentially solved by the richness of the stories offered by stakeholders. The context for this paper emerges out of a campus planning project engaged between students and faculty from two universities: Florida State University and the University of Belize at Belmopan.

The paper focuses on the identification and planned resolution of a specific issue which arose during the campus planning process. Specifically, this paper will discuss how the perceptions of university students, faculty, and administration and an adjacent squatter settlement were important in the creation of the campus plan with respect to issues of access and the creation of a boundary between the university and the neighborhood.

Presented at PACE University’s Annual Conference on Issues of Space and Place, Pace University, New York City, New York, April 2004.

Lucy’s Feat: Frederick Law Olmsted’s Journey Through Texas

2004 marks the 150th anniversary of Frederick Law Olmsted’s travels on horseback through the new State of Texas, to the edge of the frontier (just beyond San Antonio), and into Mexico. This journey was in part commissioned journalism, partly an anti-slavery crusade, but mostly a big adventure for the East Coast gentleman farmer and his brother, Olmsted went on to become the creator of Central Park and the first American landscape architect. The journal that resulted from the Texas travels is a record of the Olmsted’s awakening sensitivity to the American cultural landscape. It is also a remarkable record of the settlement of our state at that time, as seen through the eyes of a strongly opinionated outsider. This talk introduces the audience to this important text through a critical examination of Olmsted’s political and social reflections.

Presented to the Planning Forum at the University of Texas at Austin, Austin, Texas, April 2004.

Hurricane Risk Perceptions Among Florida’s Single Family Homeowners

Hurricanes and associated storm damage remain a constant threat to the health, safety, and welfare of residents in Florida. Hurricane risk perception has been found to be an important predictor of storm preparation, evacuation, and hazard adjustment undertaken by households, such as shutter usage. Planners and policy makers often employ expert risk analysis to justify hazard mitigation policies, yet expert and lay risk assessments do not always agree. Because the public is increasingly involved in planning and policy decision-making, consistency between “expert” risk assessments and lay perceptions of risk are important for policy legitimization and compliance. This article examines factors contributing to hurricane risk perceptions of single-family homeowners in Florida. Utilizing data from a statewide survey, we first map and spatially analyze risk perceptions throughout Florida. Second, we examine the influence of location on shaping homeowner perceptions along with other factors, such as knowledge of hurricanes, previous hurricane experience, and socioeconomic and demographic characteristics. The findings suggest there is a good deal of consistency between residing in locations identified by experts as being high hurricane wind risk areas and homeowner risk perceptions. Finally, we discuss the implications of these findings for land use and hazards planning.

To be published in the Journal of Landscape and Urban Planning.
George O. Rogers  
Professor, Sr. Fellow with Hazard Reduction and Recovery Center  
Department of Landscape Architecture and Urban Planning  
Ph.D., University of Pittsburgh, 1983; M.A., University of Waterloo, 1976; B.S., Oregon State University, 1975.

Dr. Rogers is interested in the areas of sustainability, risk analysis and planning, technology and society, and quantitative methods.

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Long-term Development of a Watershed: What determines when enough is enough?

It has been observed that human activity is making damage from flooding worse by building in the floodplain. Development in a watershed also systematically augments the potential for flooding by changing the watershed’s function with respect to the flow of water. This presentation examines the impact of land development in a closed watershed over a fifty-year period. It analyzes the relationship between land development and the amount of flow out of the watershed. The results lead to an enhanced understanding of the mechanisms that result in augmented flooding and an ability to use planning tools and policies to more effectively control development to avoid watershed problems years before these problems become apparent through their event history.

This study of sustainable development examines the development of a watershed in the greater metropolitan area of Houston, Texas where flooding has become a major issue, and intervention by planners has been minimal.

To address the first issue of “Is flooding getting worse?” data was obtained from the USGS. The recorded daily maximum flow (in CFS) from the month of the watershed was obtained for every day from June 1, 1936 to December 31, 2000. Flow from the watershed was increasing, but could it be related to changes in precipitation? Data to address this issue were obtained from NOAA sufficient to determine rainfall (in hundredths of an inch) in the watershed from January 1, 1949 to December 31, 2000. Still, the number of days with above-expected outflow given the rainfall on that day increased exponentially.

But could the increase in flow be related to development in the closed watershed? Development data for every property in the watershed was obtained from the Harris County Appraisal district. These data were geo-referenced to account for the relative position to each other as well as within the watershed. Each parcel included its location, boundary, area, year of development and sufficient items to estimate the impervious footprint of the building(s) on the property. These data were combined using GIS techniques to address spatial patterns of development and watershed output. The results were accumulated annually for the watershed and examined to determine how the patterns changed throughout the 50-year period.

While conventional wisdom that watershed impervious cover is important in determining the impact of development on watershed function is confirmed, impervious cover alone is not sufficiently sensitive to guide development decisions that impact the long-term future of the watershed. For example, the double impact of roads as impervious cover and roads as streambed channels is missed entirely when only impervious cover is considered. In addition, this work finds that residential development is important, not just the associated impervious cover. This seems to be driven by the idea that developed properties are designed to shed excess water, rather than absorb it. Finally, these impacts are made more serious by a double exponential process.

To measure the long term impact of land development on watershed flooding, investigators poured over National Oceanic and Atmospheric Administration records from Houston, Texas dating back to 1936. (Generic flood photo from the NOAA archives.)

CoAuthor: DeFee, B.

Financial Effects of Reverse Auction Bidding on Telecommunications Contractors

The purpose of this study was to identify and analyze the “financial impacts” of reverse auction bidding (RAB) on telecommunication contractors. More specifically, the research objectives were to identify and quantify revenue, profit, cash flow, and expense changes incurred by telecom contractors that have participated in the reverse auction bidding of jobs in comparison to jobs using traditional bidding.

In order to identify these financial impacts, a case study was conducted on a telecom contractor. The case study identified both financial and non-financial factors affecting telecom contractors. From the case study a mail-out survey was built and sent to a sample of other telecom contractors to gather data for analysis.

With the data gathered from the surveys and organized in a database, statistics were run to describe the findings. Descriptive statistics were used to present the data. In addition, correlation tests were also run on the data to find relationships between the variables. The results showed that RAB had an overall negative effect on telecom contractors' revenue, gross profit, gross profit margin, and cash flow. The data showed a similar negative effect on the non-financial effects as well. Overall the effects of RAB on telecom contractors were negative. Not one telecom contractor was satisfied with the RAB process.

CoAuthors: Bilbo, D., Horlen, J., Novak, J.
This will be the first presentation on this study.

Integration of Structural and Architectural Design for Comprehensive Design: An Engineer’s Perspective

Comprehensive Design, as interpreted by a faculty member with training in engineering and experience with teaching structural course work at two schools of architecture, is defined with respect to the levels of thinking outlined by Bloom's Taxonomy of student performance. Areas of difficulty with respect to technology courses are summarized. Performance expectations are compared to the comprehensive design criteria required of engineering schools by the Accreditation Board of Engineering and Technology. Assessment and evaluation of the comprehensiveness of student design with respect to what technical faculty want, what design faculty want, and what employers and engineering consultants want will be discussed. Methodologies used in schools of architecture will be compared and contrasted with respect to criteria and outcome, and the application of problem-based learning methods used in engineering education will be investigated.


Construction Equipment Selection

Scrapers are valuable construction equipment for large earthmoving operations. Their production rates vary widely as they depend on the equipment performance, operation’s travel time, and haul-road conditions. Determining the most economical selection of the size, model and number of scrapers is a rather tedious process that involves repetitive calculations. A spreadsheet application was created in order to facilitate such calculations and select the most economical scraper from the list of available equipment for the job under consideration. The application is made of seven spreadsheets containing a scraper's database, performance charts, soil properties, and other supporting worksheets. The application provides a user interface to solicit all data entries specific to a project. Once the user enters the required data, the system compares the production rate, time required for the job, determines the estimated unit cost for each scraper in the database and recommends the most economical selection.

Development and Calibration of an Earthquake Fatality Function

Structures present a risk during seismic events from partial or full collapse that can cause death and injury to the occupants. The United States Geological Survey (USGS) has collated data on deaths from and magnitudes of earthquakes. These data have not previously been analyzed to establish any relationships between fatality tolls or fatality rates in different earthquakes. An investigation of the fatality catalogue establishes a bounding function for the Twentieth Century fatality data using the USGS assigned earthquake magnitude as the dependent variable. A simple equation was established and calibrated to relate the fatalities in earthquakes having tolls lower than the bounding function to the bounding function. This equation and the calibration data, essentially for unreinforced masonry and timber-framed buildings, provides a procedure for estimating fatality counts in future theoretical events with a specific combination of circumstances.

Potential uses of the fatality function with further refinement include economic analysis of seismic mitigation alternatives for unreinforced masonry structures. Current uses of the fatality function can be for real time estimating of fatalities in earthquakes in remote locations, and estimating fatality counts in future earthquakes for planning purposes.

CoAuthors: Nichols, J. and Beavers, J.
Published in Earthquake Spectra, August 2003.

The Earth Construction Course at Texas A&M University

The Department of Construction Science at Texas A&M University has, since 2002, offered a graduate class in earth construction as part of their Master of Science in Construction Management degree. The objective of the class is to introduce students to the use of earth as a construction material. This class signals a re-birth of interest in earth building techniques at Texas A&M University that actually began with the publication of Earthen Home Construction by Lyle Wolfskill, Wayne Dunlap and Bob Gallaway in March, 1962. This document, which was published by the Texas Transportation Institute, provides an overview of several earth building techniques. Texas has a large stock of adobe buildings, particularly in the western part of the state. The College of Architecture at Texas A&M University draws a large number of graduate students from countries where earth is still a contemporary building material. These two factors were instrumental in the decision to develop a graduate class in earth construction. The earth construction course is preceded by a course in sustainable construction.

CoAuthors: Burt, R. & Graham, C.
Presented to the Adobe Association of the Southwest, El Rito, New Mexico, May 2004.
Richard A. Burt
Assistant Professor
Department of Construction Science
Dr. Burt’s special interests lie in historic preservation, adobe and other earth construction, and photogrammetric measurement and visualization of historic buildings.
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Robert B. Warden
Associate Professor
Department of Architecture
M.A., University of New Mexico, 1994; M.Arch., Texas A&M University, 1986; B.S., Purdue University, 1974.
Professor Warden’s areas of interest are in historic preservation and documentation and philosophy of architecture.
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A tiled panorama of the Pointe du Hoc D-Day battlefield.

The Survey & Documentation of Pointe-du-Hoc Historic Battlefield, Normandy, France

PRESENTATION I: BURT
The Site, Significance and Objectives of the Project
Pointe du Hoc is a medium coastal battery built as part of Hitler's Atlantic Wall. On the morning of June 6, 1944 Lt. Colonel James Earl Rudder led the 2nd Ranger Battalion up a shear cliff face under enemy attack to capture the battery in what is considered one of the most heroic acts of D-Day. Pointe-du-Hoc is the most iconic of the D-Day Battlefields that still retains many of the cultural resources from the day of the battle. The site is under the perpetual care and maintenance of the American Battle Monuments Commission. This presentation explains how the Historic Resources Imaging Laboratory at Texas A&M University is attempting to survey and document the battlefield using topographic survey data, aerial reconnaissance photographs and other documentary evidence. The presentation addresses the following topics: the significance of the battlefield, the results of a reconnaissance visit in September 2003 to identify cultural resources and evaluate scope of the project, the availability of supporting documentary evidence such as bombing reports and aerial reconnaissance photographs to support development of the site plan, and the efforts of the project team to obtain funding for the project.

PRESENTATION II: WARDEN
A Report on the First Season’s Work
For three weeks in June 2004, four faculty and 12 graduate students from Architecture, Geology and Geophysics, Construction Science, and Archaeology began the task of collecting data at Pointe du Hoc in Normandy, France. Pointe du Hoc is a medium coastal battery built as part of Hitler's Atlantic Wall. On the morning of June 6, 1944 Lt. Colonel James Earl Rudder led the 2nd Ranger Battalion up a shear cliff face under enemy attack to capture the battery in what is considered one of the most heroic acts of D-Day. This summer's work focused on three main objectives:
- To gather data on the existing condition and location of six of the structures. This will allow the production of architectural drawings of these buildings in their current state.
- To record photographically the Observation Post and Ranger Memorial. This will allow for the building to be measured digitally using photogrammetric methods and will ultimately allow the production of a virtual model of the building.
- To identify significant underground features using geophysical methods such as ground penetrating radar. Work has continued this fall at College Station to produce the architectural drawings and develop a web site for the project. In September the Historic Resources Imaging Laboratory was awarded a $40,000 grant from the National Center for Preservation Technology and Training to continue with the work in June 2005.

CoAuthors: Burt, R., Warden, B., Dickson, B., Everett, M.

Three Museums

Museum lighting must balance the exhibition and conservation needs. Exposure to light gradually causes permanent damage to many museum objects. Light is radiant energy, and when radiant energy strikes on the surface of a material, it can cause degradation.

Site inspections to the museums at different times of the year, site surveys, and detailed computer simulations have shown that direct sunlight strikes several display areas. Site assessments at these museums showed that several display areas receive direct sunlight, about one third of the annual daylighting hours with vertical illuminance levels ranging from 2,000 lux to 11,500 lux over valuable oil paintings. These illuminance levels exceed the maximum recommended lighting standards for oil paintings. Curators at these museums have taken several measures to protect their artwork by incorporating dark tinted glass, dark sunscreens, fixed interior louvers, interior fabrics, block completely windows with dark opaque boards, cover paintings on a daily basis, and some galleries are left empty during specific months of the year.

The main goal of this research was to identify good lighting qualities and/or adverse lighting conditions in each of the selected museum galleries. The findings of this research will serve as design guidance for lighting museums.

Carol J. LaFayette
Assistant Professor
Department of Architecture
Professor LaFayette’s interests are in film, video, and conceptual art with an emphasis on the language of images. She is also the faculty advisor for the Aggie SWAMP (Screenwriters, Actors, and Movie Producers) Club.
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Liliana O. Beltran
Assistant Professor
Department of Architecture
Dr. Beltran’s areas of interest are in daylighting design and analysis, climatic design and lighting, intelligent building facades, climate-responsive design of vernacular and contemporary architecture, sustainable design and green buildings, and energy & daylighting design tools.
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The Tales of Three Museums

Light in museums is necessary to enhance and view museum objects; at the same time, light can be harmful and destructive, and reduce the life of the museum objects. This paper presents the assessment of lighting exposure of specific exhibit areas in three museums located in the Dallas-Fort Worth Cultural District in Texas. These museums are: the Modern Art Museum by Tadao Ando (2002), the Kimbell Art Museum by Louis Kahn (1972), and the Amon Carter Museum by Philip Johnson (1961, 2001). Each of the museums presents different lighting conditions. The study focused on specific galleries that include daylighting as the main source of ambient lighting. Each selected gallery is examined, assessed on the site and simulated using state-of-the-art lighting tools. These galleries were evaluated according to good lighting practice: lighting exposure, glare, visual adaptation, and ultraviolet radiation.

Museum lighting differs from other types of lighting design. Museum lighting must balance the exhibition and conservation needs. Exposure to light gradually causes permanent damage to many museum objects. Light is radiant energy, and when radiant energy strikes on the surface of a material, it can cause degradation.

Site inspections to the museums at different times of the year, site surveys, and detailed computer simulations have shown that direct sunlight strikes several display areas. Site assessments at these museums showed that several display areas receive direct sunlight, about one third of the annual daylighting hours with vertical illuminance levels ranging from 2,000 lux to 11,500 lux over valuable oil paintings. These illuminance levels exceed the maximum recommended lighting standards for oil paintings. Curators at these museums have taken several measures to protect their artwork by incorporating dark tinted glass, dark sunscreens, fixed interior louvers, interior fabrics, block completely windows with dark opaque boards, cover paintings on a daily basis, and some galleries are left empty during specific months of the year.

The main goal of this research was to identify good lighting qualities and/or adverse lighting conditions in each of the selected museum galleries. The findings of this research will serve as design guidance for lighting museums.


Carol J. LaFayette, the video feature presents a generous collection of images by artists such as TRIO, Sarajevo, and E.K. Huckaby, Atlanta, as well as images of war by international photojournalists. The DVD package contains artwork by Atlanta artists Hope Hilton, Tom Ferguson, and Karen Tauches.

■ Presented at Solomon Projects, Atlanta, Georgia, December 2003, and at Zebra Poetry Film Film, Berlin, July 2004.
Architecturalizing the Serenbe Community Plan

This paper describes a presentation given in Atlanta, Georgia describing the on-going work for Serenbe Community being planned in south Fulton County outside of Atlanta, Georgia. Empirical research conducted in England was applied, beginning in 2001, with a series of charrettes that were organized at various planning scales and a community plan of interconnected villages and hamlets was designed and approved by the county with the first of these villages — the Artist Village — now in construction. Part of the evolution of this unique project has been the inclusion of graduate architectural work generated by Career Change students in the Department of Architecture at TAMU, to which this paper is largely focused. A partnership between the private sector of developers and landowners and the academy has created rich and productive results.

The community plans employ a transect spatial organization accompanying omega-shaped geometric order. At the extremities of the plan, single-family estate homes are placed away from the main access road within the existing canopy of trees. As the plan progresses nearer the center of the community, buildings move closer to the road, move closer to one another and eventually change in use from residential to commercial building types. This gradient of land use, building typology and density provides an interesting context and challenge within which to create architectural forms and corresponding public places. The two studios were organized by Drs. Phillip Tabb, AIA and Vallie Miranda, who guided the transformation process from plan to three-dimensional form.

It has been at the center of this transect that the TAMU students have interpreted the intentions of the plan and generated innovative architectural designs. In the summer of 2003 the first group of twelve students focused on the west live-work cluster and the commercial village center. While the buildings represent the urban center of the community and are connected to one another, each student was able to formulate their own owner profiles, program of activities, and resulting architectural designs. However, each student had to respond to the designs of adjacent projects and contribute to the form of the overall public space(s).

The West Court Live-Work project was a wedge-shaped site with eleven live work units and a shop. In the center of the wedge was planned an intimate pedestrian plaza, primarily to be shared by the residents of the project. The designs responded to the urban fabric of the place, the changing topography and individual internal needs. The developer of the project, Steve Nygren, selected two of the projects for actual construction. In the spring semester two graduate students, Jason Herber and Jeff Chapman, were flown to Atlanta to meet a local architect, charged with executing their designs, and the actual building owners, who provided some additional input. Construction has begun on each of these live-work units with completion targeted sometime in spring 2005.

The East Court Live-Work project, completed at the end of this summer, combined nine live-work units and a commercial center with a large pedestrian plaza. Using similar design pedagogy, students generated personal programs and site specific individuated architectural designs. Unique to this project was the nesting of live-work units by retail building projects and an attempt to create a magnetic village center complete with plaza, tower, and market pavilions. The changing topography and clustered and variable forms provided a playful and exciting urban design. The collaborative work being conducted at Serenbe provides both developers and students with valuable learning opportunities and useful products where ideas are generated, tested and actually realized.

Presented at a workshop in Palmetto, Georgia, May 2004.
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The Role of Creativity in the Future

The institutions of higher learning that do not adapt to change, create change and produce new knowledge will become lower tier universities as the 21st Century will generate more progress in technology, genetics and artificial intelligence than in all of recorded history. Creative thinking will be paramount to the survival of the human species. Intellectual property will be the coin of the realm. The world has gone from hunting and gathering to farming, farming to factory, from factory to knowledge work and now from knowledge work moving into knowledge creation. The creative mind capital of a nation will determine a nation’s future place in world power in every category. Technology is accelerating at an exponential rate and the nations without the creative mind capital to produce new knowledge will be left behind. The number of a nation’s population engaged in knowledge creation will predict the future health of a country. Institutions of higher learning will have to reverse the existing pedagogy of rote memory to discovering and generating knowledge. No longer can society progress with instructing students on the present and past when the half-life of most degrees is three years. Creativity must become a fundamental element of education at every level. New curriculums must be developed to achieve optimum behavior in mind capital and knowledge creation.


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Philosophy in the Flesh: Embodied Realism and Significant Form

An architecture of the body is emerging out of theories of biology, complexity, and systems by utilizing an evolving organism as its metaphor. Autopoiesis is the term used by biologists to describe the realm of existence for a living organism as it slides between the interchange of structure and information. Incoming information is filtered through the organism for its usefulness in the art of staying alive. Structural or organizational changes evolve as the organism adjusts to new information.

To remain a viable organism-to survive means that an entity must keep evolving without surrendering identity. Humans must maintain an embodied identity, often referred to as an organized self, while viably exchanging information with other entities and the environment.

The role of cognition in this equation is to allow humans the use of embodiment to explore abstract ideas through metaphor (such as “grasping and idea”). In doing so it allows the invention of an evolving language that refers to things “outside” our skin, like buildings.

My understanding of flesh is that it is another of our organs; in this case, however, it serves as a porous filter, delicate and complicated. It is our body boundary. Buildings have boundaries of foundation, wall or roof, parts of which could be thought of as the “skin.”

In today’s practice the various skins of a building have become more complicated and porous as the field of architecture extends itself into “systemic” conditions, within and without. Architecture is beginning the process of aligning itself with a new moral code—one that is inclusive of our biological reality, the embodiment of ideas, systemic evolution, and ecological necessities.

Presented to the American Society for Aesthetics, Santa Fe, New Mexico, July 2004.

A futuristic scene from the Isaac Asimov-inspired movie “I, Robot,” set in 2035.

Photo courtesy of Twentieth Century Fox

Autopoiesis is the term used by biologists to describe the realm of existence for a living organism as it slides between the interchange of structure and information.
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Drawing Book: An Update

The current digital revolution’s impact on a plethora of disciplines is an accepted fact of discourse. In the field of architecture and design, for a decade or more now, advances in both computing and user sophistication are also accepted facts of discourse. What has apparently diminished reciprocally with these advances is the use of drawing, that is, manual drawing, in virtually every aspect of these fields. As an instructor of drawing in the College of Architecture at TAMU for more than two decades, I have witnessed this decline in both pedagogy and practice; drawing is simply being replaced by digital imaging. Drawing is not being supplemented by digital media, or added to the available range of media, it is being replaced. This is defendable in several respects and could be left at that, except that there are qualities associated with drawing that do not translate to digital media. This issue and other issues are the topics of a book I have been working on for about six years. The book is primarily visual and intended to be a celebration of the manually created image in an age of digital images. To date, it contains over 150 pages and several hundred drawings.

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Growing Up

The selection of four of my photographs of children and adults by Austin Art in Public Places for the Health and Human Services Administration Complex rekindled an interest in photographing people. After focusing on natural forms for the past ten years, I realized I had also amassed a large number of photographs that dealt with people of all ages, sizes, races and ethnic backgrounds from many areas of the world. After reviewing them carefully, a progression of age and development began to emerge; a pattern of growth from days old to oldest age. This work is now emerging in book form, and the ages are divided into childhood, adolescence, parenthood and senior years. Essays by two prominent psychologists will accompany the photos.

Presented to Austin Art in Public Places for the Health and Human Services, Austin, Texas, July 2003.
Digital Art

A presentation of aesthetically based digital forms. Using a simple matrix structure, basic methods of marking are explored through computer generated drawings. We will see the translation of a digitally based form as its own content. Core essences of these virtual images are compared with traditional drawings and paintings. In analyzing digital materiality we will discuss beauty and the quest for a sublime transcendence through the technology.


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Modeling Expressive 3D Caricatures

The concepts of abstraction, simplification and exaggeration, which are very common in traditional art and caricature, can directly be applied to the 3D modeling process. Therefore, the development of methods to teach these concepts is essential for 3D computer art and design education. In this work, we present an educational method to teach students these artistic concepts by modeling expressive 3D caricatures. This method has been successfully used in a geometric modeling course that combines artistic and scientific aspects of 3D modeling. Using the method, all the students, regardless of their artistic abilities, can create convincing 3D caricatures.

CoAuthor: Reisch, J.

Angelina Jolie by Angelique Ford
William Defoe by Frank Chance
Laurence Fishburne by Kevin Singleton
Healthy Cities in China

With one quarter of the world’s population and the fastest growing economy in the history of the world, China is rapidly changing from an agrarian to an urban nation, from an agricultural based economy to a manufacturing and industrial based economy.

The development of a larger infrastructure and industrial capacity to meet the needs of the people and industry and the demands of world markets has also created unprecedented condition and challenges for China. This economic growth has resulted in challenges of biodiversity, ecosystems, human health, air quality, global warming, and pollution.

A country as large and as diverse as China faces challenges whose magnitudes and scope are bigger than any other country in the world. Because we live in an interdependent world, China’s problems become challenges for the rest of us. And drawing on the experience from other industrialized nations, China can avoid the mistakes they made.

The four major areas that require serious attention and forward-thinking public policy are:

1. Infrastructure, energy and transportation; and a healthy and productive population.
2. Economic growth, balanced economic growth, trying to achieve ZPG, the tidal wave of migration from rural to urban areas, and most importantly, the creation of healthy habitable communities.
3. Balanced economic growth, trying to achieve ZPG, the tidal wave of migration from rural to urban areas, and most importantly, the creation of healthy habitable communities.
4. Adequate food for the population; adequate water supply; an adequate infrastructure, especially energy and transportation; and a healthy and productive population.

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The Architect as Master of Two-Part Inventions

My thesis is: Although the creation of architecture requires “single-mindedness of purpose,” its invention necessarily draws upon two complementary “parts” or “aspects of knowledge,” the one concerning the TECHNICAL or TECHNIQUE (1) and the other the POETIC.

To structure the ABC of architecture’s “Two-Part Inventions,” let’s begin with “A,” which in architecture should stand for “ART.” We are inclined to speak loosely of the Art of Architecture or Baukunst, as though, having only a cursory view of its presence we pretend to know what it is all about (2). So our observations about architecture tend to thrive on over-familiarity with the object and little or no knowledge of the subject.

In a word, we want to possess the prize in a game for which we lack almost total knowledge of the rules. Indeed, we should understand that such rules cannot be learned in the way one learns those of mathematics, because the Rules of Baukunst are playable only when one is in possession of deep and often discomforting knowledge.

We might proceed to “B.” This means citing its origins, as in “B” for Bach, because Johann Sebastian Bach invented Two-Part Invention. (3) And Bach, as in “brook,” babbled his way through 32 Inventions, putting sparkle into the spring of our modern musical cadence. “B” also stands for “The Beatles,” who drew on Bach’s Two-Part Inventions as they brooked our cultural landscapes and archaeological diggings. And what do The Beatles have to do with matters of construction? The answer is everything. For they spawned the arches of Beatle-Mania, against which our delusory notion of producing a popular form of modern architecture is but an impoverished and low-impact cult. (4)

The success of Beatle-Musik totally depends upon the bi-particle nature of its invention. It’s not simply a “sound of the 60s,” but a total integration of the “now” within the music-culture of Bach’s Baroque contribution. So it provides an admirable demonstration of the use of technique in the historical process, which is more easily learned, and the complementary part of the invention which refers to my concept of “Building a Vision Beyond Seeing.” (5) That is, after all, Bach’s essential contribution.

Marco Frascari has subdivided the Two-Part Invention by creating two categories in the first part, under “A” and “B,” then defining the second part as “C.” (6) In Frascari’s case, the C stands for Cantor (my cultural accentuation of his “troubadour”), who sings the prevailing melody, intertwining it within the fabric and texture of technical accomplishment. As with any form of song — lieder, fado and, of course, balad — knowing the rules is not enough. In any language, the object of the game lies beyond regulation, and is discovered and explored within the cultivated terrain of fluency.

NOTES:
2. Peter McCleary: His famous remark, originally made at a Seminar in the University of Pennsylvania, April 1965. “This is where we find out what you’re all about!” (Scottish-English pronunciation being “oot” and “about.”
5. Malcolm Quantrill, AN EMMENTHAL CHEESE THEORY, Journal of Architectural Education, Volume 43/1, Fall 1989 (referred to also in Lecture at Texas A+M University, Architecture Lecture No.1 Fall 2004
6. Marco Frascari, Foreword to THE UNMADE BED OF ARCHITECTURE, Rakennustieto (Building Books) Inc, Helsinki, Finland, 2004

Presented at Los Instituto Tecnologico Estudios Superiores de Monterrey, Queretaro Campus, Mexico, May 2003.
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Model-Based Motion Filtering for Improving Arm Gesture Recognition Performance
We describe a model-based motion filtering process that, when applied to human arm motion data, leads to improved arm gesture recognition. By arm gestures, we mean movements of the arm (and positional placement of the hand) that may or may not have any meaningful intent. Arm movements or gestures can be viewed as responses to muscle actuations that are guided by responses of the nervous system. Our method makes strides towards capturing this underlying knowledge of human performance by integrating a model for the arm based on dynamics and containing a control system. We hypothesize that by embedding human performance knowledge into the processing of arm movements, it will lead to better recognition performance. We present details for the design of our filter, our evaluation of the filter from both expert-user and multiple-user pilot studies. Our results show that the filter has a positive impact on the recognition performance for arm gestures.
CoAuthor: Schmidt, G.
Presented at the Fifth International Workshop on Gesture and Sign Language Based Human-Computer Interaction, Genoa, Italy, April 2003.

A Computer Simulation Model for Emergency Building Evacuation with ARENA
During an emergency, such as fire, allowing occupants to safely exit from the building requires clear and established paths of escape. Designing these means of escape egress demands more than just calculating pedestrians flow rates and occupant loads. This paper describes a computer simulation model for emergency fire evacuation of an educational building with Arena. The large floor plan of the College of Architecture Building-A was divided into various subsystems in order to model within the technical limitation for the academic version of the Arena software that was used in this research. The simulation model helped in finding the congestion/queueing in corridor spaces, the maximum time taken by people to evacuate if a fire breakout, and the exit stairs’ duration of use during evacuation.
CoAuthor: Balasubramanian, S.

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XML-Based Vector Graphics: Application for Web-Based Design Automation
Most retaining walls and box culverts have expedited the design process of these structures, the process of collecting and distributing the resultant engineering documents has not been fully integrated with the computer applications. We have been developing a Web-based design automation system to manage the resultant documents as well as to speed up the repetitive design process.
Manipulation of engineering drawings in the Web page is one of the critical functions needed for Web-based design automation. eXtensible Markup Language (XML) and XML-based vector graphics are expected to facilitate the representation of engineering drawings in the Web page. In this paper, we present how we used XML and Scalable Vector Graphics (SVG) to compose engineering drawings and represent them in the Web page. XML Data Island we designed to define drawing components turned out effective in manipulating the engineering drawings in the Web page.
CoAuthors: Lho, B., Kim, J., Kim, Y.
Presented at the 7th International Conference on Computing in Civil and Building Engineering, Weimar, Germany, 2003.
Column Modeling

Modeling shapes with a large number of holes and handles while requiring minimal human inter-
action is a difficult problem in computer graphics. Such shapes are common in classical architecture
in many parts of the world. These forms are domi-
nated by columns, beams and arches. This type of
construction in architecture is not restricted to clas-
sical architectural styles but is also prevalent in
modern architectural designs.

In this work we have developed a new tool which
allows users to create such complex and architec-
turally interesting models with extreme ease. The
tool extends the capabilities of our existing topologi-
cal mesh modeler and is designed to be interactive
and easy to use.

Our tool is geared towards
use by artists and architects. It
can be used to create inter-
esting architectural
forms, either to
create real and
virtual environ-
ments or
represent
existing
architectural forms in a stylized manner. It can also
be used to create various other artistic
shapes that would be difficult to gener-
ate using traditional modeling meth-
ods.

CoAuthors: Mandal, E.,
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Akleman, E.

Presented at the
Visual Proceedings
of ACM SIG-
GRAPH 2004, Los
Angeles,
California, August
2004.

Changing the Culture of
Design Studio Reviews:
The Use of Large Format
Interactive Plasma
Screens in Design Studio
Reviews

This paper elaborates on the
use of electronic pin-ups in real-
time local reviews making use of
larger format interactive plasma
screens.

The paper briefly explains the
technical aspects of an actual
implementation in the College of
Architecture at Texas A&M
University. The main focus of the
paper is placed on the use of a
61interactive plasma screen in a
graduate design studio during
the second semester of 2003
and the benefits that such an
implementation has reported.

The narrative explains how the
use of an interactive plasma
screen for informal as well as for-
mal reviews is not only saving
printing resources, but it is also
having a very positive impact on
how we conduct design reviews.

Presented at ECAADE ’04,
Copenhagen, Denmark,
Demonstration of the use of Multimedia Electronic Information Enhancements for a Chapter Handbook CD-ROM Overview (1017-RP)

A set of enhancements to the ASHRAE Handbook (ASHRAE) are presented to demonstrate the effectiveness of multimedia and advanced presentation techniques such as 3D computer graphics, visualization and animation techniques. These results can also serve as a model and guide for the broader use of these techniques in other ASHRAE publications.

CoAuthors: Akeleman, E., Haberl, J., Parke, F., Skaria, S., Halstead, J., and Andrews, M.


Facial Animation: History and Applications

A survey of the development of computer facial animation over the past 35 years, a look ahead to the future of computer facial animation, and an introduction to the major uses of this technology.

Presented at the SIGGRAPH Conference, Los Angeles, California, August 2004.

Digital Innovation and Organizational Change in Design Practice

The real estate and construction industry is among the largest industries in the world. It also is one of the most fragmented industries, with few economies of scale and historically low productivity. Recent technological advances in the use of information and communication technology have the potential for dramatically improving construction productivity. But substantial organizational barriers exist that inhibit the effective adoption of these technologies. This research project (in progress) examines the practices of selected, innovative firms in order to develop an in-depth understanding of the factors that have influenced the effective adoption of information and communications technology in the design and construction industry, and, potentially, provide examples that can provide prototype models for an alternative, future organization of the AEC industry.

CoAuthor: Laepple, E.

Presented at the ACADIA Conference, Muncie, Indiana, October 2003.
THE INSIDE STORY: Courtyard Experiences in an Eastern Mediterranean City: Antakya

The courtyard houses are distinguished embodiments not only with their urban but also with their social role in shaping the complex identity of the Mediterranean cities. The courtyard can be seen as the primary unit of the city, the larger cultural context, which is physically and socially produced.

As the core of the house, the courtyard constitutes a contact ground for self identity and culture; a sophisticated spatial construct with all levels of interaction between privacy and publicity. The existence of courtyards with their place-bound identity is becoming more important in contemporary Mediterranean cities which are in need of contextual consolidation and transformative processes for new developments that could be done without losing the memory. The role of the courtyards are essential at that point because of their capacity to embody this dual character of the memory, the private and the public, united and assimilated in their built form.

The courtyard houses of the city of Antakya, which are the leading actors in this study, are expressing the unique values of locality in a city center that is still home to a multicultural community, their houses of worship, public and private institutions. Founded by Seleucids in 300 B.C., the city of Antakya was a vital metropolis of the Roman Empire, the third in the rank after Rome and Alexandria. After that period, the city went under the control of Byzantine, Arab, Seljuk, Mamluk and Ottoman civilizations which caused overlapping of different urban layouts and formed a meeting place of diverse cultures. Through history the city has been destroyed by several big earthquakes that made changes in topographic conditions and serious damages erasing the traces of the past urban fabric. However, the courtyard houses preserved their presence through transformation of building forms and superimposition of diverse urban layers which are enriched by cultural values. More than the houses the courtyards made the way of living.

Although the remaining contexts of courtyard houses are still a physical part of the city of Antakya, the contemporary production of space in the city is now far from its social content. The values of courtyard spaces, which seem to be ignored by dominant contemporary culture, need to be rediscovered to sustain the living quality of the place.

This study is an attempt to explore a more comprehensive understanding of the role of courtyards and the deep expression of place concept revealed by the experience of the built forms in that particular eastern Mediterranean city.

Enhancing Quality of Life for Older Adults: Improving Outdoor Access at Assisted Living Facilities

Although spending time outdoors is known to have potentially therapeutic benefits for older adults, many long-term care facilities may not adequately support resident needs for outdoor access. Two studies were conducted at assisted living facilities to explore resident preferences for outdoor activities and environmental features. Fourteen facilities were selected randomly from all facilities having more than 50 residents in a 12-county region of southeast Texas, which included the city of Houston.

Using focus groups and written surveys, the first study found high levels of interest in outdoor access, with preference for specific activities (such as walking and sitting/watching), as well as for environmental elements such as fresh air, greenery, and comfort features. Residents indicated they typically felt better physically and psychologically after being outdoors, but that existing facility environments presented several barriers to outdoor access. The second study generated photographic comparisons based on the findings of the first study, to further test some of the main constructs that emerged which fell into the general categories of 1) relief from the indoor environment, 2) indoor-outdoor connections, and 3) activity as a factor in outdoor usage. The photo survey assessed each of these theoretical categories with two “patterns” showing how they might be actualized in the built environment (four examples of each pattern yielded 24 photo comparisons). To isolate the variables of interest, digital techniques were used to manipulate a single element in each pair — otherwise both photos were identical. Significant levels of preference were found for the hypothetically preferred images in all 24 pairs. The findings of both studies will be compared, and discussed in terms of the potential for specific design application.

B. Presented to the Environmental Design Research Association, Albuquerque, New Mexico, June 2004

Urban Design for the Walking Child: Pedestrian Design and Public Health

Mom knows what’s best for her child, especially where walking safety is concerned. Even though parents know that walking makes their children healthy, they sense too much danger in the street. In this project, parents of young children in Bryan/College Station, Texas, provide researchers with insights into how urban street design can discourage healthy behavior. These insights, gathered during focus group discussions, were used to build six variations of virtual pedestrian worlds at Texas Transportation Institute. Variations in sidewalk location, buffer width and presence of trees were tested in the simulator experiment under real-time peak-hour traffic conditions. Each of the twenty-seven parent participants in the simulator experiment “walked” through each world, answering multiple choice questions regarding their willingness to walk and their perception of safety, as well as their willingness to let their children walk and their perception of safety for their children.

The results from the original parent focus group were confirmed in the simulation experiment. Parent’s perception of overall safety is significantly different among the six pedestrian environments (F(5, 25)=27.26, p<.0001). Walkability and perceived safety is significantly higher in pedestrian environments with a landscape buffer between the sidewalk and the traffic lane than with the sidewalk adjacent to the traffic lane. Our conclusion is that certain features and combination of features in the design of pedestrian landscapes may encourage parents to let their children walk to school.

Co-Author: Naderi, J.

B. Presented at the American Public Health Association Annual Conference, Washington, D.C., January 2004

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Megatrends in Health Facility Design  
Professor Mann will present Recent Architecture for Health projects undertaken by his graduate and undergraduate studios at Texas A&M University. He will also relate these projects to “Megatrends Affecting Health Facilities Design.”  

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Evidence-Based Design for Healthcare  
The presentation defines evidence-based practice and healing environments in the design of complex healthcare environments. Four levels of practice are described, each with an increasing level of rigor. Several examples are given of projects that feature research-based decision-making.  
The author concludes that practitioners need to be increasingly rigorous with their interpretation of credible research findings, and ultimately have a moral obligation for the safety of patients as strict as an aircraft designer’s obligation for the safety of their ultimate passenger.  
The relevant implications of the evidence-based model to other practice types is the analogous decision-making required in education, criminal justice, and other demanding or complicated building types.  
Presented at the AIA Board Committee on Knowledge Management Summit, Austin, Texas, April 2004.
Evidence-based design for infants and staff in the neonatal intensive care unit

The sensory and perceptual environment of the neonatal intensive care environment has a significant impact on staff and infants. To create appropriate spaces designers must understand relevant theories of environmental psychology such as Environmental Press Theory, Prospect and Refuge Theory and the concepts of control, choice, territoriality and privacy. Developmental issues for infants and stress issues for staff will be discussed in this context. Recent research on light, noise, music and the visual and spatial environment will be summarized and the future of evidence-based design explored.

Donald A. Sweeney
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Dr. Sweeney's professional interests involve all aspects of health systems policy, planning management. His current interest includes participation in the international healthier communities movement.
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Healthy Communities in the West: History and Concepts

The rapid urbanization in the 1800 and 1900s in the West was fueled by many factors including the demands and promises of the industrial revolution. Towns quickly became cities with large populations at urban densities never experienced before. Massive new, unanticipated problems plagued the new urbanites and public officials charged with somehow managing them. For many, the promises of better lives in cities went unfulfilled. Many of the solutions cities developed for the difficult challenges they faced were effective, but thorny residual problems from that era persist today along with whole sets of new ones.

But something new is stirring. Something is different about the way many cities and communities are beginning to approach their problems: a growing awareness that stubborn issues, like violence, homelessness, drug abuse, race relations, inequality, weakening family structures, poverty, decaying infrastructure, sparse participation in civic affairs, inadequate access to health and social services, and many more must be traced back to root causes and attacked there. The growing number of movements which have spontaneously developed across the globe seem to share many common characteristics. Whether sustainable communities, livable cities, safe cities, smart cities, green cities, clean cities or whole communities, the focus is on an approach to community building which is systemic, long-term, and highly participatory. The phrase "healthy communities" is used in this piece for all broad-based, community-wide efforts to improve the quality of life. Implicit in all of these movements and explicit in the several thousand healthy communities initiatives around the world is a broad definition of health, a new paradigm for planning, and a systemic perspective.


Community Needs Assessment: Profile of unmet needs and at-risk populations using 2-1-1 data

Information and Referral (I&R) 2-1-1 programs provide valuable services to communities by connecting those in need with appropriate community resources. The non-emergency 2-1-1 systems are expanding rapidly throughout the U.S. and will become as pervasive as 9-1-1 emergency systems. This program also may be considered a “gold mine” of data to determine unmet needs and access barriers in the community.

Traditionally, community needs assessments that provide this scope of information are costly, fragmented, and time-limited. In contrast, evaluating the existing I&R 2-1-1 database is a low-cost, all-inclusive analysis of all those seeking I&R help for unmet needs over time.

Agencies throughout a community can benefit by these findings: 1) determine high risk groups for outreach services, 2) coordinate services to address complex clusters of needs, and 3) support policies to reduce access barriers. The purpose of this presentation is to discuss the findings from analysis of 2-1-1 data in the Brazos Valley 7-county region, 2002. These findings serve as a case study to illustrate the potential of exploring this “gold mine” of data applicable to other 2-1-1 programs nationwide.


The following invited and/or refereed presentations and papers were delivered or published during the 2003-04 academic year by faculty of College of Architecture faculty at Texas A&M University. Green text denotes presentations scheduled for the 2003 faculty research symposium.

**Abrams, Robin F.**

**Akleman, Ergun**

**Alexander, John H.**


**Bame, Sherry I.**


Bame, Sherry. *Aging TX Well: TAES & TEES and Public Policy Research Institute (PPRI)*, College Station, TX.

Beltran, Liliana


Blake, Nan Standish

Blake, Nan. *Growing Up, Austin Art in Public Places for the Health and Human Services Administration Complex*, Austin, TX, July 2003

Blake, Nan. *Dwellings, Juried Exhibit, IDEA Austin Artists Coalition*, Austin, TX, January 2003

Brody, Samuel D.


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Keynote

Continued from page 3

His program focuses on sustaining indoor environments for designing, operating and maintaining indoor environments. His program focuses on sustainable building solutions that maximize occupant’s health and satisfaction through improved acoustics, thermal comfort, and lighting use.

The National Research Council is the Canadian government’s premier organization for research and development. NRC-IRC develops and maintains the core competencies and the knowledge base critical to the needs of the Canadian construction industry, supports the development, commercialization and implementation of leading-edge technologies, and fosters the provision of safe and sustainable built-environments through the development of codes and standards.

The NRC-IRC includes five key program areas: Indoor Environment, Building Envelope and Structure, Urban Infrastructure Rehabilitation, Fire Risk Management, and Codes and Evaluation. The center is also headquarters for Canada’s National Guide for Municipal Infrastructure and the Canadian Center for Housing Technologies. Atif earned a Ph.D. from Texas A&M University in 1992, a Master’s Degree from UCLA in 1987 and a Professional Bachelor Degree in Architecture in 1984. He served on the A&M faculty from 1990 until 1992. As a research officer at NRC, he managed more than 20 research projects which have made significant contributions to the improvement of indoor environments while maximizing operations and maintenance costs related to energy and lighting.

Since May 2004, Atif has been the chairman of the IRC’s Cross-Program Research Committee, which manages the Sustainable Built Environment portfolio. He is also on the executive committee of Canada’s Panel for Energy Research and Development – Building and Communities. The committee develops and implements strategic plans for a $20 million federal research program for energy conservation and sustainable buildings and communities.

Atif currently serves on a federal committee charged with climate change mitigation. Between 1996 and 1998, he led the Canadian team in Vancouver’s Green Building Challenge and served on the International Framework Committee that developed green building performance indicators. Atif also serves as chairman of the International Energy Agency’s Executive Committee for Buildings and Community Systems (ECBCS). The committee oversees collaborative research between 23 countries for energy conservation and sustainability in buildings and communities. It also manages the dissemination of an implementing agreement which includes the Air Infiltration and Ventilation Center in Brussels, Belgium.

Since its inception, the ECBCS has completed 40 research projects investigating local energy planning for communities, environmental aspects of buildings, moisture and heat in the envelope, ventilation, HVAC, building envelope, and fuel cell application in housing. Throughout his career, Atif has worked with Canadian partners to champion research and development on healthy buildings. In 2002, he was elected to the board of Canada’s Healthy Indoors Partnerships, Inc. (HIP), a multi-sectorial, public-private partnership that promotes healthy buildings. As chairman of HIP’s Strategic Research Committee, he led and organized the Science & Technology Workshop on the health and remedial aspects of mold. In 1999, Atif received the IRC’s Outstanding Corporate Award for Industrial Partnership for a multidisciplinary research project on indoor environment and energy performance in large glazed spaces. In 1998 he earned the IRC’s Outstanding Achievement Award for Research. He has served on numerous editorial boards, including the Journal of the Illuminating Engineering Society of North America (IESNA). He served as chairman of the IESNA Technical Committee on Daylighting from 1997 until 2002, when he received the IESNA Presidential Award. He has authored more than 100 publications, including book chapters and articles for refereed journals and conferences. He has been on several technical committees in ASHRAE, IAE, IESNA, and has given several training/professional courses in the area of daylighting/lighting; and energy aspects of buildings.

Brody, Samuel. Ecosystem Planning, Rangeland Ecology and Management Seminar Series, Texas A&M University, College Station, TX, September 2003.


Burt, Richard A.


Choudhury, Ifte M.


Davison, Richard R., Jr.


Deviren, Senem


Downing, Frances E.


Eldin, Neil N.


Ellis, Christopher D.


Hamilton, Kirk


Hamilton, Kirk. Designing the Organizational Culture and an Environment to Support It, HealthCare Design '03, Miami, FL, December 2003.


Graham, Charles W.


Giusti, Cecilia


Geva, Anat


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Haque, Mohammed E.


Hill, Rodney C.

- Hill, Rodney. **Creativity's Role in the Singularity**, American Creativity Association, Houston, TX, April 2004.


Hillier, Karen E.

- Hillier, Karen. **After the Hunt**, Archives Gallery, University of Houston, Houston, TX, April 2003.

Holliday, Shelley D.


Horlen, Joe

- Horlen, Joe, Bilbo, D. and Novak, J. **Financial Effects of Reverse Auction Bidding on Telecommunications Contractors**.
House, Donald H.
- House, Donald H. and Schmidt, G. Model-Based Motion Filtering for Improving Arm Gesture Recognition Performance. The 5th International Workshop on Gesture and Sign Language Based Human-Computer Interaction, Genoa, Italy, April 15-17, 2003.

Huang, Chang-Shan

Johnson, Robert E.
- Johnson, Robert. Digital Innovation and Organizational Change in Design Practice, ACADIA Conference, Indianapolis, IN, October 2003.

Jourdan, Dawn

Kalas, Gregor

Kang, Julian H.

Kweon, Byoung-Suk

LaFayette, Carol J.

Lee, Chanam
- Lee, Chanam and Moudon, A.V. Walkable Communities: Correlates of Walking for Transportation Versus Physical Activity, American Collegiate Schools of Planning – Association of European Schools of Planning Joint Congress, Leuven, Belgium, July 2003.
- Lee, Chanam. Built Environments for Transportation Versus Recreation Walking: Similarities and Differences.

Li, Ming-Han
- Li, Ming-Han. Comparison of Field and Laboratory Experiment Test Results for Erosion Control Products, American Society of Agricultural Engineers Paper No. 032382, 2003.

- Li, Ming-Han. Investigating Applicability of Biotechnical Streambank Stabilization in Texas, Report No. FHWA/TX-01-1836-1, Texas Transportation Institute, College Station, TX, 2003.


Lindell, Michael K.


- Lindell, Michael. Recent Issues in Rweg, RWG, RWG(j) and RWG(J), Texas A&M University Hazard Reduction & Recovery Center, College Station, TX, 2003

Mann, George J.


- Mann, George. Proposed New Presbyterian Garland Center for Diagnostics and Surgery, A Short Stay Hospital and Medical Office Building, Presbyterian Hospital, Dallas, TX, December 3, 2003.


- Mann, George. Recent Architecture for Health Projects at Texas A&M University, GUPHA Meeting & International Hospital Federation Meeting, San Francisco, CA, August 4, 2003.


- Mann, George. Presentation of 9 Projects, HRCA – Hebrew Rehabilitation Center for the Aged, Boston, MA, April 24, 2003.


Miranda, Valerian


Naderi, Jody R.


- Naderi, Jody. Pedestrian Traffic, Texas Transportation Researcher, College Station, TX, 2003.

Neuman, Michael C.


Nichols, John M. *The Use of Web Based Learning Curricula Using PDA*, 4th Annual Assessment Conference, College Station, Texas, March 2004.


Nishimoto, Taeg. *Descriptive Programming – Fictive and Imaginary*


Peacock, Walter Gillis. *Cross-National and Comparative Disaster Research, Methods in Disaster Research, 2003*


Global Presentations

FACULTY RESEARCH 2003-2004


Rogers, George O.


Seidel, Andrew D.


Sharkawy, Atef M.


Shepley, Mardelle M.

Shepley, Mardelle. Evidence Based Design for Infants and Staff in the Neonatal Intensive Care Unit, Journal of Perinatology, Houston, TX, November 2004.


Smith, James C.


Srinivasan, Vinod


TABB, Phillip J.


Tassinary, Louis G.


Ulrich, Roger S.


Varni, James W.


Varni, James. *The PedsQL in Type 1 and Type 2 Diabetes: Reliability and Validity of the Pediatric Quality of Life Inventory Generic Core Scales and Type 1 Diabetes*, Diabetes Care 26, 631-637, 2003.


Vasquez de Velasco, Guillermo


Volkman, Nancy J.


Warden, Robert B.


Williams, Yauger R.


Woodfin, Thomas M.

Woodfin, Thomas. *Cartography, Commerce & Trade in Early Texas*, Wineland Symposium; University of Texas Center for American History, Austin, TX.

The Center for Housing and Urban Development

is a research and outreach center dedicated to improving the quality of life of Texas residents. Major programs in CHUD include the Colonias Program, which is designed to assist residents of low income settlements; Target Cities, which annually selects a city in Texas to receive assistance from graduate students; the Community Planning & Design Program, in which faculty and students work with a community or region within Texas; and the Economic Development & Heritage Marketing Program, which is also directed toward a community or region within Texas.

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The Center for Health Systems and Design

was created by the Colleges of Architecture and Medicine to promote research, teaching, and communication in an interdisciplinary program that focuses on health facility planning and design. Research interests of faculty associates range from the effects of environmental stress on patients' well-being and health to evidence-based design of hospitals, nursing homes, neighborhood clinics, healing gardens, accessible communities, and healthy cities. CHSD also supports graduate student education and research opportunities that lead to the interdisciplinary Certificate in Health Systems and Design.

The Environmental Psychophysiological Laboratory is administered by CHSD. This lab measures human physiological and behavioral responses to computer-simulated environments and real settings. Researchers in the Environmental Psychophysiology Laboratory study the effects of the natural and built environments on perception, cognition, emotion and behavior, exploring linkages to health and well-being.

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The CRS Center for Leadership and Management in the Design and Construction Industry

was approved by the Board of Regents of the Texas A&M University System in 1990. The purpose of the CRS Center is to advance innovation and leadership in the design and construction industry. The Center is also the repository of the business archives, slide archives, publications and architectural program library of CRS. The architecture engineering and planning firm and its successor firm CRSS. The Center also manages the Rowlett Lecture Series and sponsors the following annual awards: The CRS Archive Scholar, the CRS Center PhD Scholar and the Jonathan King Student Research Awards. The center also administers the graduate certificate program in facility management. Current research interests include the impact of information technology on facility management and other issues related to leadership and management in the design and construction industry.

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The Hazard Reduction and Recovery Center

has the distinction of having been designated a Collaborative Centre by the United Nations Office for the Coordination of Humanitarian Affairs - being one of only two such centers worldwide. The HRRC also supports other international agencies such as the International Atomic Energy Agency and the Organization of American States and is the only university-based institution in the United States to have performed statewide hurricane hazard analysis and evacuation planning. HRRC staff are currently involved in or completing four projects sponsored by the National Science Foundation - "Hurricane Andrew Ten Years Later," "Develop an Evacuation Management Decision Support System," "Damage Synthesis: Socio-economic Impact Assessment," and an NSF Career Award by Samuel D. Brody entitled "Modeling Watershed Flooding and Adaptive Flood Management." The HRRC also sponsors the College of Architecture's Certificate in Environmental Hazards Management.

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The Historic Resources Imaging Laboratory

was established in 1991 to build upon a twenty-year tradition of documenting historic and cultural resources to the standards of the Historic American Buildings Survey. It now acts as the focus for historic preservation teaching, research and service at Texas A&M University. Faculty Fellows represent disciplines in six colleges across the university who support graduate teaching and research. Professional Fellows are practicing professionals in architecture, landscape architecture, planning and engineering who support the academic programs by visiting lectures, internships and financial assistance. Activities include recording of resources from medieval Europe, Native American dwellings, vernacular buildings, and National Historic Landmarks; analysis of historic buildings for reuse; preservation planning, interpretation for heritage tourism; preservation of cultural landscapes; and understanding the relationship between historic buildings and sustainable design and new construction. The Certificate in Historic Preservation was established in 1995 and provides graduates with an understanding of the field and specialized knowledge applicable to their discipline. An annual Historic Preservation Symposium brings international and national experts to examine aspects of preservation theory and practice.

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The Visualization Laboratory

supports the research activities of the Visualization Sciences graduate program as well as other related research activities of the college. Activities of the laboratory are centered around the digital computer as a tool for visual communication. Areas of research include 3D modeling, animation, image synthesis, visual effects, virtual communication, digital photography and videography, and visualization software. The laboratory houses a heteregeneous array of visual workstations, sophisticated visual software, video production facilities, and specialized devices for data capture, interaction, and image input and output.

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