1957 graduates now…

…and then.

1957 grads endow college's first class-sponsored scholarship

Thirteen of the 18 surviving Texas A&M architecture former students who graduated together in 1957 were honored guests at the department's 2007 Awards Banquet last April in College Station. The classmates were recognized for endowing the College of Architecture's first class-sponsored scholarship.

Class member Larry Priesmeyer was instrumental in coordinating the class-wide scholarship initiative, explained Larry Zuber, the college's senior director of development.

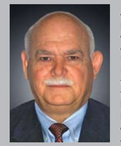
The members of the Class of '57, especially John Only Greer, senior faculty member and college archivist, are well-known to current students who roam the halls of the Langford Architecture Center on the Texas A&M campus. Their class photo, taken 50 years ago on the steps of the Williams Building (above right), is posted high on the wall opposite of the elevator door on the first floor of the Langford A building.

While on campus for their 50-year reunion, the 13 classmates, who actually have different official "class years," took time to recreate that original photo, posing mostly in their original positions on the Williams Building steps.

Pictured in the 2007 photo (above left) are: Frank Cinatl '56, Larry Priesmeyer '56, Bill Huffhines '56, Charles Holcomb '56, Bill Bedford '56 (back), Don Emerson '56 (lower), Kirby Keahey '56 (hands in pocket), Ed Reeder '56 (above Greer), John Greer '55, Bill Sheveland '56, Carl Maynard '54, and Durwood Pickle '54.

Donor launches David Pugh Scholarship

Funds sought to endow fund honoring planning professor



Pugh

An anonymous donor is leading the way in creating an endowed scholarship honoring David L. Pugh, a longtime leader in urban planning education at Texas A&M University and the state of Texas. The David Pugh Urban Planning Scholarship will be awarded annually to students pursuing a master's degree in the field at Texas A&M. The donor made the lead gift to encourage his fellow former students and friends of the popular professor to help the fund reach a level that will permanently fund an annual award.

Larry Zuber, director of development for the Texas A&M Foundation in the College of Architecture, which houses the program, notes that many charitable former students make their gifts because of what faculty members did for them when they were students.

"These mentors made a difference in their lives, and now they want to honor their professors with an investment that will aid every generation of student that will follow," said Zuber.

Pugh began teaching at Texas A&M in 1976, and was an associate professor and program coordinator as well as head of the former Department of Urban Planning from 1981 to 1985. In addition to teaching land use and historic preservation law, he studied utopian cities and initiated and administered the department's Texas Target Cities Program. He earned a law degree from the University of Missouri, and both a master in regional and city planning and a bachelor of fine arts from the University of Oklahoma.

Pugh retired in 2004. His academic career followed a long career in professional practice, and he was a mentor to many generations of Aggie planners.

Former students and others interested in contributing to the David Pugh Urban Planning Scholarship should contact Zuber at 979-845-0939 or l-zuber@tamu.edu.

College recognizes eight Outstanding Alumni

Beale Hawes Hinojosa Riveire Slaney Swank Tipping Wynn

Last November, the Texas A&M College of Architecture bestowed its highest honor to eight extraordinary former students who, over the years, have laid the foundations on which the college has built a tradition of excellence through academics, research and service. The 2007 Outstanding Alumni are: Craig Beale '71, executive vice president of HKS, Inc.; Velpeau E. Hawes, Jr. '58, retired architect; Jesús (Chuy) H. Hinojosa '58, Texas A&M professor emeritus; Richard Riveire '83, principal with DMJM Rottet; Scott Slaney '76, principal with SWA Group; Arch Swank '36, posthumous award; Eldon G. Tipping '68, president of Structural Services, Inc.; and Will Wynn '84, mayor of Austin, Texas.

■ *Read the complete story and bios online at archone.tamu.edu.*

College hosting Nov. 7-10 summit to examine collaboration in the built environment disciplines

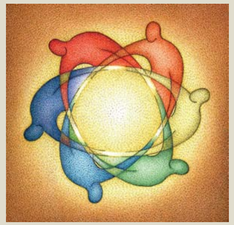
National leaders and scholars in the design, construction, and planning disciplines will gather in College Station Nov. 7-10, 2007, for a summit that will critically examine the emerging role of collaborative partnerships in the built environment disciplines.

The summit, "Collaborative Partnerships in the Built Environment Disciplines: Imperatives for Action," sponsored by the Texas A&M University College of Architecture, will be held at the Hyatt Place and Hawthorne Suites in College Station, Texas.

"In recent decades, social, demographic, economic and political changes, along with the growth of scientific and technical knowledge and communication innovations, have vastly increased the scope and complexity of issues related to these fields of research and practice," explained Forster Ndubisi, summit organizer and head of the Department of Landscape Architecture and Urban Planning at Texas A&M. "These transformations and innovations have prompted designers, planners, constructors, social scientists, and many others, to join in addressing complex issues that are best examined simultaneously with knowledge from different perspectives."

To this end, Ndubisi noted, a variety of collaborative models have emerged, including multi-disciplinary, cross-disciplinary, inter-disciplinary, and trans-disciplinary partnerships. Each model offers a unique approach for addressing complex problems and issues through the integration of deep knowledge from diverse perspectives.

The Nov. 7-10 summit will explore how state-of-art knowledge about collaborative partnerships, including drivers, integrative models, strategies, best practices, and matrixes for evaluation, can be re-



interpreted, synthesized, and made more relevant to education, research, and creative scholarship within the built and natural environment disciplines.

In addition to scholars from the built environment disciplines, summit organizers are inviting academicians in the arts, humanities and social sciences. The summit will feature position papers, keynote presentations from leaders in the field and focused work sessions. Several key papers will be commissioned prior to the conference and a subset of the outcomes of the summit will be submitted for peer-reviewed publication.

Details on abstract submission and summit registration are available online at: http://archone.tamu.edu/conted/CollaborativePartnership/

ENDS matriarch

Grandmother heads back to college as the oldest student at A&M

Not content with doing volunteer work, Shirley Ankenmann is getting her architecture degree at Texas A&M University — and at 72, she's the oldest student on campus and proud of it. The senior Aggie also is a proud grandmother — all the more so because her grandson, Michael Wilson, is a fellow architecture student.

"I had a successful career in drafting," Shirley says, "and it took me all over the United States, including 20 years in Alaska. In 1996, I came to College Station to help my son and his wife by caring for their children while they started a new business, but I soon found that helping out took only about half my time."

"I decided to go back to school in 2000 and chose to enroll in the College of Architecture to study design, a field I'd always been interested in."

Shirley says she's often been told that her presence as a non-traditional student helps push her younger classmates to achieve more. The other students also appreciate the extensive research she carries out — and shares — for each project, she says.

Some of the projects Shirley and her teams have worked on include the Presbyterian Hospital and Medical Center, the Cambodia Landmine Museum and the East Austin Green Corridor Development, to name just a few.

■ *Read the complete story in the online edition of the archone. newsletter: http://archone.tamu.edu/.*

Not content with doing volunteer work, Shirley Ankenmann is getting her architecture degree at Texas A&M University — and at 72, she's the oldest student on campus and proud of it. The senior Aggie is also a proud grandmother — all the more so because her grandson, Michael Wilson, is a fellow architecture student.

College launches multidisciplinary degree in Urban & Regional Science

Broad curriculum offers six areas of specialization

This fall, the Department of Landscape Architecture and Urban Planning (LAUP) at Texas A&M University is launching a new undergraduate degree program, the Bachelor of Science in Urban and Regional Science (BS-URS).

Approved last May by the Texas Higher Education Coordinating Board, the program will be the department's sixth degree offering and its second undergraduate degree option.

According to LAUP department head Forster Ndubisi, the BS-URS "rounds out the department's academic degree programs, taking advantage of the skills and expertise of its faculty while providing a broad-based, multidisciplinary education from which students can acquire the skills and knowledge necessary to create livable, sustainable and safe communities."

The BS-URS program will prepare graduates for entry-level positions in a variety of fields — especially those requiring analytical skills and critical thinking. It will also offer a well-rounded education for advanced studies involving the analysis of economic, environmental, political, and social forces and the development of solutions that shape neighborhoods, communities, cities and entire regions.

The BS-URS is the first undergraduate program of its kind in Texas. Its broad-based, multidisciplinary curriculum differs it, Ndubisi said, from Texas' only undergraduate program in urban planning, which is currently offered through the geography department at Texas State University.

"While the Texas State urban planning program focuses on professional skills and knowledge, our program emphasizes multidisciplinary theory, analytical methods and applied, real world problem solving," explained Ndubisi.

Also, while broad in scope, Texas A&M's BS-URS program allows students to specialize in one of six areas of study: hazard and emergency planning; housing, economic and urban development; health and human services planning and policy; land development; landscape and sustainable urbanism; and spatial analysis and planning.

These areas of specialization are very important, said Ndubisi, as they "build on the strengths of our faculty members while enhancing the overall complement of our department. They also provide a venue for our master and doctorate students to become more involved in our undergraduate programs."

LAUP's other undergraduate program, the Bachelor of Landscape Architecture, is a highly specialized studio-based program, which is rightly taught, Ndubisi noted, almost exclusively by landscape architects.

"The BLA program, like many of the degree offerings in the College of Architecture, focuses on design," explained Ndubisi. "However, there are a number of students with an interest in the built environment and in building and planning sustainable communities, who are not particularly interested in a design-oriented program. Our new BS-URS program should appeal to those students."

The department is planning to further develop the BS-URS offering, he added, by seeking approval for a streamlined four-plus-one degree offering. If approved, this will allow motivated BS-URS students to continue directly to the Master of Urban Planning or Master of Science in Land Development professional degree programs and complete their graduate studies in a shortened amount of time.

■ *Read the complete story about interdisciplinary initiatives in the online edition of archone.*

College sustains interdisciplinary focus, initiatives

Texas A&M University boasts the largest College of Architecture in the U.S., but it's not just in size that its distinction lies: The college's three departments also are leading the way in interdisciplinary initiatives, a teaching and research thrust that many academics regard as the wave of the future. And because the college is one of the few accredited design schools that house all of the "built environment" professions, it is uniquely suited for interdisciplinary study.

"Our college hosts three unique departments that work well together, at the same time they function superbly as separate entities," says Tom Regan, dean of the College of Architecture. "But, from another perspective, our college's faculty is truly interdisciplinary — they represent not only those disciplines traditionally associated with the virtual and built environments, but also come from a variety of other academic areas, such as computer science, medicine, law, economics, sociology, psychology, engineering, art and even physics.

"While all of us recognize our college's important mission to produce competent professionals, we also realize that the world around us is integrating. It becomes increasingly important that our students understand the interdependence and interrelationships of various disciplines, so it is crucial that we integrate our teaching mission and our research across the academy."

To facilitate this mission, the college has established three interdisciplinary professorships, one for each department, to be funded through more than $500,000 in donations from Harold L. Adams '61, chairman emeritus of architecture firm RTKL Associates, Baltimore.

Additionally, the college is home to five interdisciplinary research centers, which together involve students from various academic programs in a wide range of research and design projects.

The Center for Housing and Urban Development, led by architecture professor Jorge Vanegas, for example, marshals faculty from all three departments to address special problems in urban areas.

complete stories and more pictures online at

archone.tamu.edu

Editor's note: The articles and news briefs about the Texas A&M College of Architecture appearing in this publication are but a small sample of the 100 stories appearing in the archone. newsletter's summer 2007 online edition: http://archone.tamu.edu.

DreamWorks CEO reviews A&M 'Viz' program

"The Texas A&M Viz program turns out a great product and great students," said Jeffrey Katzenberg, CEO of animated film giant DreamWorks, who came to Texas A&M last October to meet with students and faculty in the Master of Science in Visualization Sciences program.

Hill creates Obelisk of Knowledge

When officials at Texas A&M University wanted to commission a sculpture for the institution's Qatar campus, their search for an artist went no further than architecture professor Rodney Hill, who responded with his latest work, "Obelisk of Knowledge" (pictured at left).

Immersive visualization eyed

Viz professor Frederic Parke is developing a unique low-cost spatially immersive visualization system in which the viewer is surrounded by projected images.

Promoting walkable cities

Prof Chanam Lee (above, center) is studying factors that contribute to the "walkability" of urban neighborhoods. Her research suggests that better environmental design could promote better health.

◀ *"Obelisk of Knowledge" : a wood and bronze sculpture created by Rodney Hill for the Texas A&M Qatar campus.*

Students design concepts for G.I. museum

Last spring, students in Julie Rogers' and Valerian Miranda's sophomore and senior design studios created conceptual models and master plans for the Museum of the American G.I., which is proposed for a 40-acre site south of College Station, Texas.

Preservationist examine Texas' WWII heritage

From women flying aces to prison camps, last March the Center for Heritage Conservation's conference examined Texas' distinguished World War II legacy.

Design students dominate annual Ideas Challenge

More than 75 percent of the student finalists in the 2007 Ideas Challenge, sponsored by the Center for New Ventures and Entrepreneurship at Texas A&M University's Mays Business School, were currently enrolled, or had completed, the ENDS 101 "Design Process" class. "Design thinking pays off," noted the class co- instructor Rodney Hill.

NON PROFIT ORG.
U.S. POSTAGE
PAID
COLLEGE STATION
TEXAS 77843
PERMIT NO. 215

Office of the Dean
College of Architecture
216 Langford A
College Station, TX 77843-3137

ADDRESS SERVICE REQUESTED

archone.

SUMMER 2007

COLLEGE OF ARCHITECTURE
TEXAS A&M UNIVERSITY

archone. is the official newsletter for the College of Architecture at Texas A&M University. The publication highlights news and feature articles posted in entirety online at **http://archone.tamu.edu**.

Readers may submit address changes, news, photos and comments online at http://archone.tamu.edu/college/people/alumni/update.html

Former student news and print-resolution photographs submitted to the college could be featured in a new publication, "Class Acts," which debuts this fall.

Solar groHome takes shape

Shannon Carpenter, a senior environmental design major from Aledo, Texas, readies Texas A&M's solar "groHome" entry for the U.S. Department of Energy's 2007 Solar Decathlon. In the Oct. 12-20 event on the Washington Mall, Aggies will compete with 20 teams from universities around the world. The A&M team is still accepting contributions to help realize their most excellent design. To learn more about the Aggie Solar-D initiative visit: http://archone.tamu.edu/solardecathlon/.

College of Architecture taking lead in Building Information Modeling education and research

See stories inside this issue.

Upcoming Events:

10/18 College TSA Reception

During the Texas Society of Architects Annual Convention in Austin, the Department of Architecture will host a reception 7-9 p.m. at the Hirshfeld-Moore House, located at 814 Lavaca. RSVP by Oct. 11 to Melinda Randle at 979.847.8918 or mrandle@archone.tamu.edu.

10/26 Outstanding Alumni Banquet

The College of Architecture will honor the 2007 recipients of its Outstanding Alumni Award 6:30 - 10 p.m. at the Miramont Country Club. For details, contact Trish Pannell at 979.458.0400 or t-pannell@tamu.edu.

10/29 Faculty Research Symposium

The College of Architecture's ninth annual faculty research symposium, "Research on the Built and Virtual Environments: Global Symposia 2007" features faculty presentations previously delivered at scholarly venues around the world during the 2006-07 academic year. For details, contact Trisha Gottschalk at trishag@tamu.edu.

College hosts three preeminent artists

Acclaimed graphic novelist George Pratt leads an illustration workshop as part of the College of Architecture's Spring 2007 Artists in Residence program. Pratt was one of the three participating preeminent artists who lectured and led 10-day workshops that culminated in public exhibits of student work. The other artists were Elaine Reichek, who guided the production of a video exhibit, and Gaston Nogues, who led the design and installation of a public sculpture. *Visit archone. online for full story and photos.*

Embracing BIM

College of Architecture defining vanguard of emerging technology

Building Information Modeling (BIM) software programs are changing the way architects, constructors, facilities managers and others do business. And Texas A&M's College of Architecture is at ground zero, both in using and teaching the technology — and in designing its future.

BIM uses advanced software and a single digital repository to integrate information that has traditionally been managed by multiple disciplines and a variety of software. With BIM, quantity, location, quality, cost, appearance, construction scheduling and other kinds of information are managed in a common information model.

"And, in theory, all engineering analysis can also be derived from BIM," says Mark Clayton, architecture professor and interim head of the Department of Architecture. "By combining the information essential to architects, engineers, contractors, and facility managers, BIM presents an opportunity for the industry to dramatically change its processes and patterns of responsibility. However, although likely very favorable, the costs and benefits of a BIM approach across the entire building life span are unclear."

Clayton and architecture professors Robert Johnson and Jorge Vanegas, along with the CRS Center for Leadership and Management in the Design and Construction Industry, have received a grant from the Large Firm Round Table of the American Institute of Architects to conduct a series of discussions designed to answer some of the questions that surround the new technology. The grant will allow them to conduct a number of workshops; the first involving faculty members from programs in architecture, construction and facilities management. This group will examine BIM's impact on concept design, schematic design and design development, construction and operations.

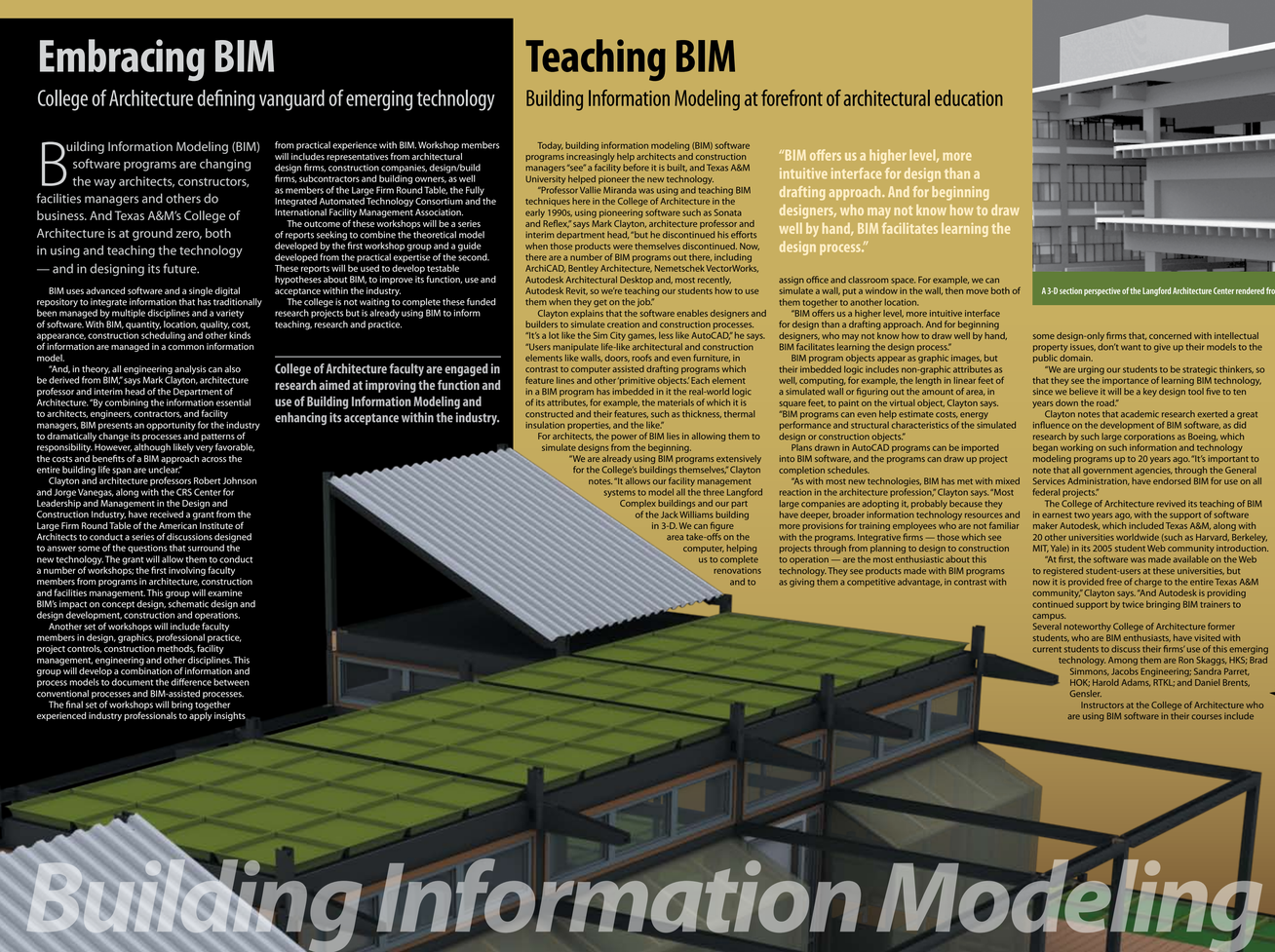
Another set of workshops will include faculty members in design, graphics, professional practice, project controls, construction methods, facility management, engineering and other disciplines. This group will develop a combination of information and process models to document the difference between conventional processes and BIM-assisted processes.

The final set of workshops will bring together experienced industry professionals to apply insights from practical experience with BIM. Workshop members will includes representatives from architectural design firms, construction companies, design/build firms, subcontractors and building owners, as well as members of the Large Firm Round Table, the Fully Integrated Automated Technology Consortium and the International Facility Management Association.

The outcome of these workshops will be a series of reports seeking to combine the theoretical model developed by the first workshop group and a guide developed from the practical expertise of the second. These reports will be used to develop testable hypotheses about BIM, to improve its function, use and acceptance within the industry.

The college is not waiting to complete these funded research projects but is already using BIM to inform teaching, research and practice.

College of Architecture faculty are engaged in research aimed at improving the function and use of Building Information Modeling and enhancing its acceptance within the industry.



Teaching BIM

Building Information Modeling at forefront of architectural education

Today, building information modeling (BIM) software programs increasingly help architects and construction managers "see" a facility before it is built, and Texas A&M University helped pioneer the new technology.

"Professor Vallie Miranda was using and teaching BIM techniques here in the College of Architecture in the early 1990s, using pioneering software such as Sonata and Reflex," says Mark Clayton, architecture professor and interim department head, "but he discontinued his efforts when those products were themselves discontinued. Now, there are a number of BIM programs out there, including ArchiCAD, Bentley Architecture, Nemetschek VectorWorks, Autodesk Architectural Desktop and, most recently, Autodesk Revit, so we're teaching our students how to use them when they get on the job."

Clayton explains that the software enables designers and builders to simulate creation and construction processes. "It's a lot like the Sim City games, less like AutoCAD," he says. "Users manipulate life-like architectural and construction elements like walls, doors, roofs and even furniture, in contrast to computer assisted drafting programs which feature lines and other 'primitive objects.' Each element in a BIM program has imbedded in it the real-world logic of its attributes, for example, the materials of which it is constructed and their features, such as thickness, thermal insulation properties, and the like."

For architects, the power of BIM lies in allowing them to simulate designs from the beginning.

"We are already using BIM programs extensively for the College's buildings themselves," Clayton notes. "It allows our facility management systems to model all the three Langford Complex buildings and our part of the Jack Williams building in 3-D. We can figure area take-offs on the computer, helping us to complete renovations and to assign office and classroom space. For example, we can simulate a wall, put a window in the wall, then move both of them together to another location.

"BIM offers us a higher level, more intuitive interface for design than a drafting approach. And for beginning designers, who may not know how to draw well by hand, BIM facilitates learning the design process."

"BIM offers us a higher level, more intuitive interface for design than a drafting approach. And for beginning designers, who may not know how to draw well by hand, BIM facilitates learning the design process."

BIM program objects appear as graphic images, but their imbedded logic includes non-graphic attributes as well, computing, for example, the length in linear feet of a simulated wall or figuring out the amount of area, in square feet, to paint on the virtual object, Clayton says. "BIM programs can even help estimate costs, energy performance and structural characteristics of the simulated design or construction objects."

Plans drawn in AutoCAD programs can be imported into BIM software, and the programs can draw up project completion schedules.

"As with most new technologies, BIM has met with mixed reaction in the architecture profession," Clayton says. "Most large companies are adopting it, probably because they have deeper, broader information technology resources and more provisions for training employees who are not familiar with the programs. Integrative firms — those which see projects through from planning to design to construction to operation — are the most enthusiastic about this technology. They see products made with BIM programs as giving them a competitive advantage, in contrast with some design-only firms that, concerned with intellectual property issues, don't want to give up their models to the public domain.

"We are urging our students to be strategic thinkers, so that they see the importance of learning BIM technology, since we believe it will be a key design tool five to ten years down the road."

Clayton notes that academic research exerted a great influence on the development of BIM software, as did research by such large corporations as Boeing, which began working on such information and technology modeling programs up to 20 years ago. "It's important to note that all government agencies, through the General Services Administration, have endorsed BIM for use on all federal projects."

The College of Architecture revived its teaching of BIM in earnest two years ago, with the support of software maker Autodesk, which included Texas A&M, along with 20 other universities worldwide (such as Harvard, Berkeley, MIT, Yale) in its 2005 student Web community introduction.

"At first, the software was made available on the Web to registered student-users at these universities, but now it is provided free of charge to the entire Texas A&M community," Clayton says. "And Autodesk is providing continued support by twice bringing BIM trainers to campus.

Several noteworthy College of Architecture former students, who are BIM enthusiasts, have visited with current students to discuss their firms' use of this emerging technology. Among them are Ron Skaggs, HKS; Brad Simmons, Jacobs Engineering; Sandra Parret, HOK; Harold Adams, RTKL; and Daniel Brents, Gensler.

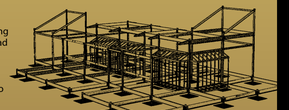
Instructors at the College of Architecture who are using BIM software in their courses include Clayton and fellow architecture professors Antonieta Angulo, Pliny Fisk, Guillermo Vasquez de Velasco, Charles Culp and Robert Johnson and construction science professor Julian Kang.

"We feel that BIM software can be used as a teaching vehicle across the curriculum, in keeping with the college's interdisciplinary thrust. And we believe that learning BIM technology can give all our students a competitive advantage."

"We feel that BIM software can be used as a teaching vehicle across the curriculum, in keeping with the college's interdisciplinary thrust. And we believe that learning BIM technology can give all our students a competitive advantage."

"Professor Fisk is using the software to track non-graphic data for the Aggie entry in the U.S. Department of Energy's Solar Decathlon competition," Clayton notes. "We feel that BIM software can be used as a teaching vehicle across the curriculum, in keeping with the college's interdisciplinary thrust. And we believe that learning BIM technology can give all our students a competitive advantage."

A 3-D section perspective of the Langford Architecture Center rendered from a BIM model created using Autodesk Revit and 3-D Studio Viz.



The Texas A&M Solar Decathlon team is using BIM software to track non-graphic data for their entry in the U.S. Department of Energy's Solar Decathlon competition. Pictured at at left and above, are renderings of the Solar Decathlon team's grohome building system — a sophisticated, high-tech approach to home building that draws upon the best ideas from across the engineering and business spectrums. The structure is composed of a modularized, dimensionally coordinated, open source kit of parts. It is attuned to green building principles to achieve high levels of carbon balancing and incorporates best practices supply chain management, achieving economies of scale unprecedented in the home building industry. The grohome is designed to anticipate changing needs of the building owner and allow for upgrades, replacements, and enhancements. Learn more on the Solar Decathlon website: http://archone.tamu.edu/solardecathlon

Defining BIM's advantages

Faculty research expected to prove BIM merits in construction

While most faculty at Texas A&M University's College of Architecture would probably agree on the educational value of building information modeling (BIM), many construction industry professionals remain unconvinced. In an attempt to address these qualms, two construction science professors have received an industry grant to apply the technology to a real-world project.

Julian Kang and James Smith, both of the Department of Construction Science, have received the $25,000 William A. Klinger Research Award from the Associated General Contractors Education and Research Foundation. They plan to use the funds to apply BIM to a hotel project in San Antonio, being built by Zachry Construction.

BECAUSE CONSTRUCTORS WHO PIONEER THE USE OF NEW TECHNOLOGIES OFTEN ENCOUNTER COST OVERRUNS AND SCHEDULE SLIPS, MANY GENERAL CONTRACTORS ARE RELUCTANT TO EXPERIMENT WITH VIRTUAL CONSTRUCTION TECHNOLOGY.

Smith and Kang have already begun their research, building an initial BIM model of the high-rise that will be the test-case for their research.

"I expect the outcome of this investigation will produce empirical evidence for the benefits of BIM in construction," Kang says. "Lack of confidence in BIM's merits make general contractors reluctant to use virtual construction technology for their projects. Many construction projects that have pioneered the use of new technologies have ended up with cost overruns and schedule slips, so few general contractors want to place their projects at such risk.

"Right now, most construction firms use BIM's 4-D capabilities — 3-D construction simulations over time — to help land a contract. Few construction firms use BIM to follow up on project progress. We hope the results of our research will help them gain the confidence they need to incorporate BIM in their day-to-day project operations."

Kang explains that while architects use BIM software to expedite building design, construction science professionals have different needs. He believes 4-D construction simulation with BIM could be used to better plan the construction sequence on the job site.

WHILE MOST CONSTRUCTION FIRMS USE BIM'S 4-D CAPABILITIES TO HELP LAND A CONTRACT, FEW USE BIM TO FOLLOW UP ON PROJECT PROGRESS. RESULTS FROM THIS RESEARCH INITIATIVE COULD HELP FIRMS GAIN CONFIDENCE ABOUT INCORPORATING BIM IN THEIR DAY-TO-DAY PROJECT OPERATIONS."

"Many project stakeholders, such as owners, government officials and prospective tenants, may not necessarily understand construction blueprints, so it is less likely they can visualize the construction sequence needed to bring a project in on time and under budget," Kang says. "BIM simulations could help such stakeholders reach consensus with construction professionals on what needs to be done to bring a particular project to completion.

BIM SOFTWARE FACILITATES COST ESTIMATES BY PROVIDING A LIST OF BUILDING MATERIALS REQUIRED FOR A CONSTRUCTION PROJECT. THIS DATA IS EXTREMELY HELPFUL TO CONSTRUCTION MATERIALS SUPPLY CHAIN MANAGERS.

"BIM software allows us to build a virtual building that tells us our materials needs, allowing us to then estimate construction costs. Such information could be very helpful to construction materials supply chain managers. Then 4-D construction simulations can be used over time to track a project's progress."

Kang says he believes construction professionals potentially want to use BIM software for many construction-related needs, but their questions about the programs have not been adequately answered by software vendors or by academic researchers, creating the crisis of confidence about using BIM for real projects.

"Jim Smith and I, as educators and researchers, want to provide individuals involved in the construction industry with tangible empirical evidence as to how using BIM could benefit them," he adds.

Before returning to school to earn his doctorate in construction engineering and management, Kang, a civil engineer, worked for ten years designing nuclear power plants.

"In my work, I used 3-D CAD products to provide integrated plant management information systems," he says. "3-D CAD combined with information from the engineering disciplines, which is theoretically identical to BIM, helped us improve the overall design process and detect collisions.

"But with BIM, we would be able to track design and construction information across the entire lifecycle of the facility, building a simulation that integrates knowledge from engineering with construction and maintenance information all the way through the de-commissioning process."

Kang points out that current practices do not deliver all the knowledge acquired in the design process to general contractors. His goal is to use BIM to continue building knowledge across the entire lifecycle of a facility. Construction schedules are dynamic, changing almost weekly based on the progress of a job. So, BIM simulations must be constantly updated to reflect real-world site progress. Kang is concerned about providing construction firms with enough experts to handle on-going BIM

"Texas A&M is one of the few architecture colleges teaching students construction visualization," Kang notes. "We are positioned to become the leader in supplying such experts."

"TEXAS A&M IS ONE OF THE FEW ARCHITECTURE COLLEGES TEACHING STUDENTS CONSTRUCTION VISUALIZATION. WE ARE POSITIONED TO BECOME THE LEADER IN SUPPLYING SUCH EXPERTS."

"My game software allows players to specify how they want to build or modify a building," explained master of architecture student Christopher McDonald. "For example, when they specify that a wall will be made of brick, the software will tell them what properties — thickness, thermal capacitance — the wall will possess. Likewise, players can specify such construction details as furniture placement. BIM software also can generate construction documents."

Game Time !

Student incorporates BIM technology into fun, instructional game

Texas A&M University students play games — serious ones. Christopher McDonald, a masters degree candidate in the architecture department, and architecture professor Charles Culp are importing architectural drawings made by Revit software into "Prey" — a powerful video game — thus creating the first steps for a visual building information modeling (BIM) simulation game for architects, constructors and facilities managers.

Culp and McDonald began this work approximately two years ago. Today, they are part of a team, with architecture professors Wei Yan and Vinod Srinivasan, that focuses on expanding the use and functionality of simulations in the classroom and in practice.

"Christopher has taken detailed architectural drawings from building information modeling software and used widely available modification tools from a $39 video game to generate realistic visual simulations of a building," says Culp.

"The game lets players configure space, estimate water and air conduit, conduct lighting and energy analyses, and all sorts of other functions common to design, construction and management," he explains. "It could serve as a great training tool for students or for those already in the industry."

Christopher uses Autodesk Revit software to prepare the building. Then he exports the building into an open file standard called the Industry Foundation Class (IFC).

"The software, IFCtoMAP, changes the model into a format understood by the Prey game," Christopher explains. "BIM software is object oriented, meaning that its basic units more closely resemble real-life. 3-D building elements like walls, doors, windows and furniture — and even human figures. BIM software contains more information about objects related to buildings, especially compared to drafting programs such as AutoCAD, which is capable only of describing objects as a set of lines.

"BIM software also allows you to incorporate properties into the building objects, such as specifying the type of material to be used in construction, its thermal properties, etc."

Christopher was able to modify the logic of open source code from an inexpensive video game to create a dynamic visual walkthrough of a building in minutes.

"Many contemporary games make the design tools used by game makers available to allow players to modify the games in certain ways, changing the artwork by adding a new character, or the game logic by making a player jump twice as high." He notes. "The rendering software by which games are 'drawn' is not open, but the logic is."

The use of games for non-entertainment purposes — "serious games" — is an emerging field of active research and is one of Srinivasan's primary areas of interest.

"Video games provide an interactive platform that is familiar to most of today's learners," Srinivasan notes. "The military has been using games for several years for training soldiers. Games have a lot of potential for educating students about energy systems and training building operators about energy-efficient practices."

Culp noted that BIM software has been around since the early 1990s, but that it has not been used in practice until recently, because the needed computer power was not available to most architects and construction professionals at an affordable price. "BIM software is very computationally intensive," Culp explains.

■ Read complete story in arch**one.** online: http://archone.tamu.edu/college/news/newsletters/summer2007