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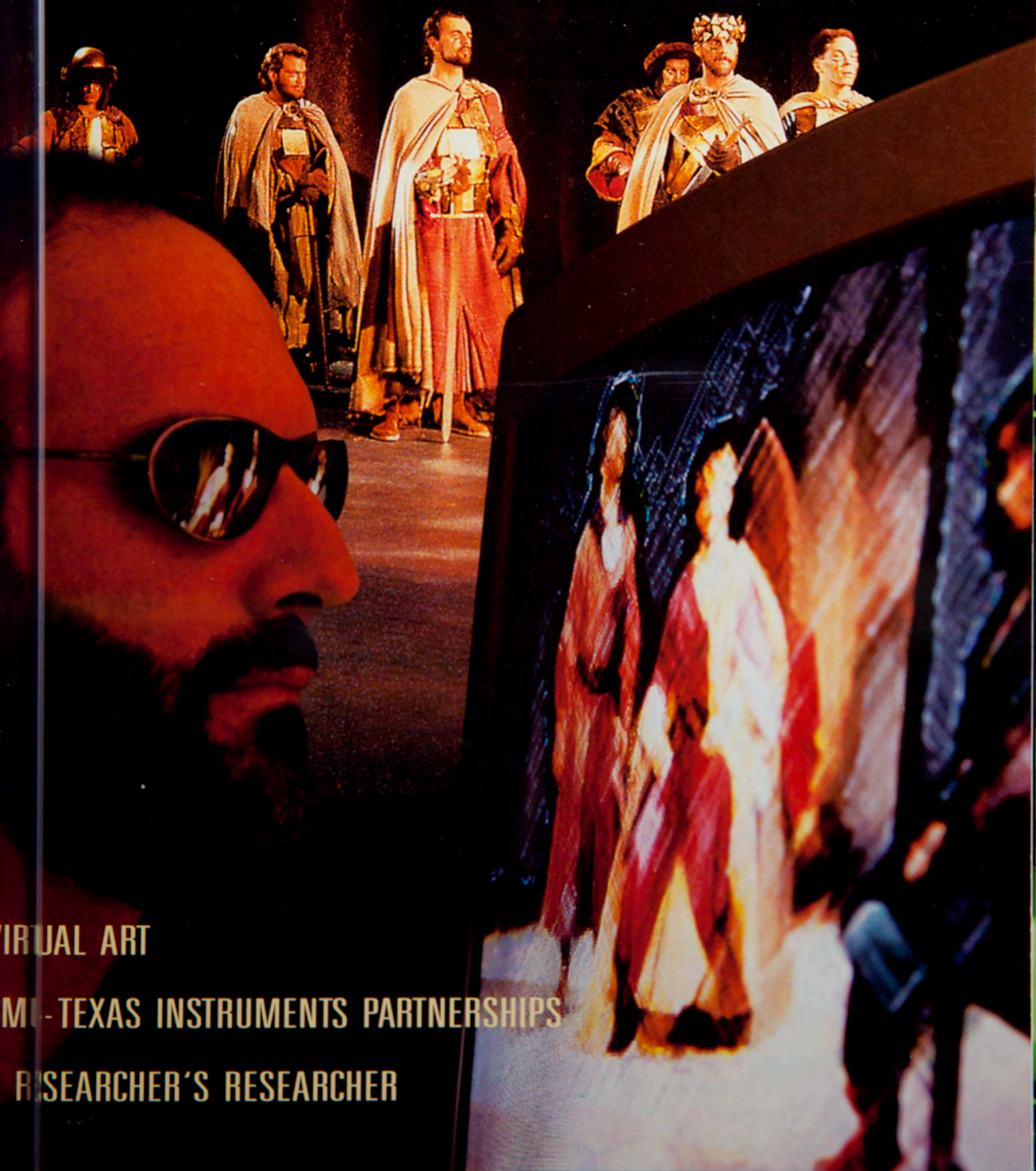
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SMU RESEARCH

Southern Methodist University

Volume 4 1997



VIRTUAL ART

SMU-Texas Instruments Partnerships

RESEARCHER'S RESEARCHER

3 Profiles

Faculty conduct research on topics ranging from business leadership to the Yucatan.



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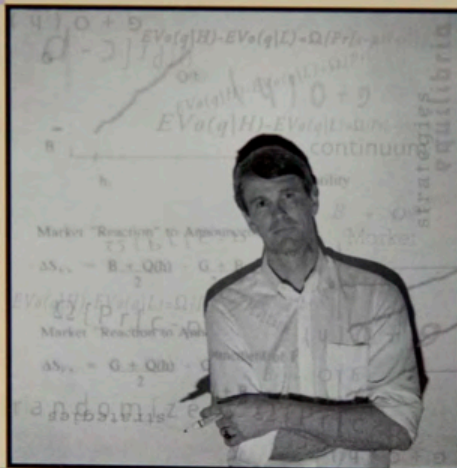
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SMU and Texas Instruments create research partnerships.



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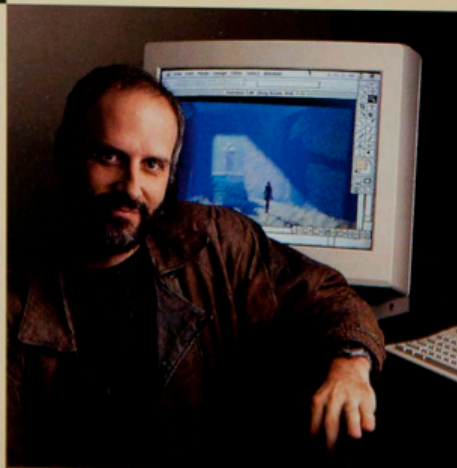
Business professor serves as link in the problem-solving process.



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Meadows professors hone their craft with the latest technology.

On the cover: David Jacques of the Theatre Division uses digital imagery to light up the stage. Photographed by Hillsman S. Jackson. Back cover illustration by Derek Box.



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Four years ago, *SMU Research* was started to provide a window on research being conducted at Southern Methodist University. In the first three volumes, we covered a wide ground, highlighting areas of research and scholastic inquiry from the University's six schools. This fourth volume continues that tradition by taking the reader across diverse disciplines, from theology to physics, from mechanical engineering to the arts, and from the media to mobile computing. Many of these projects are funded in part by business, industry, or government because they recognize the value of research to themselves or to society. Such partnerships can foster a relationship of mutual benefit, as explained in the article "Proximity Breeds Attempts."

The first article is by President R. Gerald Turner, who joined SMU in summer 1995 with a distinguished record of academic leadership as chancellor of the University of Mississippi for 11 years. He addresses in his article, "Research and the Public Realm," some of the difficult issues such as the perception of conflict that exists between teaching and research in the academy. "At SMU, they are compatible and complementary," he writes. As SMU turns to greet the 21st century, it will be the vision and goals of the Strategic Plan authored by President Turner that will set the direction of the University. The invitation to our community of readers is to share in the fulfillment of this vision.

This volume also features 15 faculty members and their research, including a longer profile on Finance Professor Rex Thompson of the Edwin L. Cox School of Business. The article "Virtual Arts" illustrates the pervasive influence of technology in art, particularly computer technology in instruction, performance, and research.

Communication is the buzz word of this age. It is our hope that this will be a two-way dialogue, so that you will feel free to tell us what you think about the magazine, the University, and specific research projects. We need your support in whatever form it takes.

U. Narayan Bhat

U. NARAYAN BHAT

Dean, Research and Graduate Studies

SOUTHERN METHODIST UNIVERSITY professors pursue exciting areas of inquiry in the laboratory, in the field, and in the great archives of the world, as this issue of *SMU Research* shows. The same professors who are internationally known scholars are usually of equal skill in the classroom. Our students do not experience these scholars from afar – in huge lecture halls that afford no opportunity for interaction. Instead, professors who are innovative and imaginative in their research bring those same qualities to their students in small classes, often providing them with opportunities to conduct their own real-world research. Balanced so ably by many professors, strong teaching and research make an SMU education truly distinctive.

It is important to make this point because often these qualities are seen as either/or propositions. At SMU, they are compatible and complementary. The University's Strategic Plan reaffirms this creative symbiosis when it articulates that "research and scholarship make an essential contribution to the teaching enterprise ... SMU's interest in supporting and encouraging faculty research and scholarship is not only an independent aim in its own right."

Research productivity also supports SMU's renewed commitment to make an impact on our city and society. When chemist Parvati Wisian-Neilson makes another advancement in altering the physical properties of certain polymers, a critical step toward developing materials such as flame-retardant plastics, she contributes far beyond the borders of the campus. When historian Thomas Knock publishes a definitive new work on President Woodrow Wilson, he offers insights on a pivotal U.S. presidency with implications for today's politics. When mechanical engineer Peter Raad works with scientists at Texas Instruments to improve modern integrated circuits, he strengthens our partnerships with industry as well as transforms technology.

No matter what forms they take, research and scholarship represent the pursuit of knowledge, the contribution of learning to the public realm, and the submission of results to public examination – all for the sake, ultimately, of enhancing the public good.

Let's look again at one part of that statement – "the contribution of learning to the public realm." Today we hear persistent and often cynical questions about productivity in education, at times arising from misperceptions about the work load of professors beyond the classroom.

In truth, most professors – especially those who, besides teaching, mentor students, sponsor activities, help with recruitment, design new courses, serve on committees, perform volunteer work, speak in the community, conduct research, give papers, publish books, and attend professional meetings – experience long and full work days, any day of the week. Instead of time off, summers are time spent gaining or developing



BY PRESIDENT R. GERALD TURNER

new knowledge. Yet it is extremely difficult to portray completely a typical "day in the life" of a professor, although we continually communicate University achievements through our public information programs. To many, however, repeating the above litany of labors simply would be misinterpreted as ivory-tower whining.

One way of showing a skeptical public that professors make significant contributions is through research productivity – not at the expense of teaching or mentoring or serving, but in addition to it. As societal challenges become more complex, the need

for information, insights, and innovation becomes greater. So does the potential that we in academia can become more active in exploring solutions, and more widely appreciated for it. Properly explained, research, in addition to its intrinsic value, can become the lens through which the academy's worth can be brought into sharper focus. Such understanding can answer critics in a constructive way, perhaps turn cynics into supporters, and ultimately preserve the academic freedom and resources so essential to excellent teaching.

To support and enhance research, SMU's Strategic Plan calls for "the review of institutional methods of support for academic research and assistance to faculty in developing new sources of support." In a period of fiscal constraint, SMU must make effective use of current resources to support research through such means as release time, research grants, equipment purchases, and computing capacity. In the face of shrinking governmental support, SMU must develop new funding sources, especially in cooperation with business and industry.

Another objective is to establish new centers and encourage emerging centers to address issues that cross academic disciplines. Current examples include the John Goodwin Tower Center for Political Studies, the Cary M. Maguire Center for Ethics and Public Responsibility, and the new William P. Clements Center for Southwest Studies. In addition, we are proposing new centers for law, business, and engineering, which will provide new opportunities for collaborative research to address key issues.

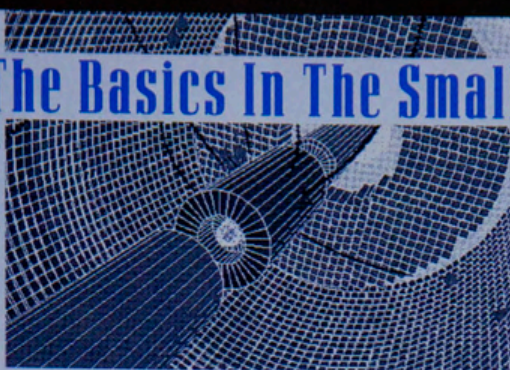
A third objective is strengthening the University library system "as the prime resource for research and scholarship." This will involve advancements in information technology, a judicious balance between print and electronic materials, and increased funding for acquisitions. SMU has the strongest library system in North Texas. Our aim is to enhance that position.

We are proud of the research and scholarship of SMU faculty. As our Strategic Plan states, "a university is at root a community of inquiry." We must advance such inquiry – for the vitality of our teaching and learning, the validity of our societal contributions, and the continuity of our tradition of excellence. ●

*"A UNIVERSITY IS AT
ROOT A COMMUNITY
OF INQUIRY."*

Looking For The Basics In The Smallest Particles

Physicist Ryszard Stroynowski is attempting to understand the smallest components of matter – elementary particles called quarks and leptons – and the interaction between them. The professor of physics in Dedman College calls his research in high-energy



physics "basic science. The benefits will show 100 years from now, just like 19th-century discoveries are recognized today," Stroynowski says.

Among the "basic constituents" of matter there exist six types of the smallest particles called quarks and six others called leptons. For several years, an SMU group led by Stroynowski has studied the properties of the heaviest known electron-like object called the "tau lepton" and of the heavy "bottom" and "charm" quarks.

Research conducted during the past 30 years has created a "Standard Model" of fundamental particles and interactions. The Standard Model is a unified description of electromagnetic and weak interactions as different aspects of the same force, Stroynowski says. Physicists know the model is incomplete, he adds. "What we are trying to do is uncover the missing components."

A collaboration of 24 university groups comprising about 200 physicists conduct the research with the CLEO detector at the Laboratory of Nuclear Studies at Cornell University. At SMU, Stroynowski and Assistant Professor Thomas Coan work with two

postdoctoral fellows and six graduate students on the CLEO research.

The planning and construction of expensive experiments often take more than 10 years to complete, Stroynowski says. "We are asking what are the most important physics problems that could be addressed in the first decade of the 21st century. For example, incorporation of strong interactions and gravity into the general theoretical framework, which already consists of electricity, magnetism, and weak interactions, would represent a major breakthrough in our understanding of basic forces. We want our students to participate in the most exciting research in the world."

A native of Poland, Stroynowski received his Ph.D. from the University of Geneva in Switzerland. He taught and conducted research at the California Institute of Technology before joining SMU.

The Tale That Keeps On Telling

In his novel, *The Land of Hope and Glory*, Marshall Terry continues the fictionalized chronicle of his "ancestral" northwards that he began 25 years ago with *Tom Northway* and *My Father's Hands*.

"Each one has an ironic edge to American history," says Terry, professor of English and associate provost for Undergraduate Education. "It's been fun to do something connected."

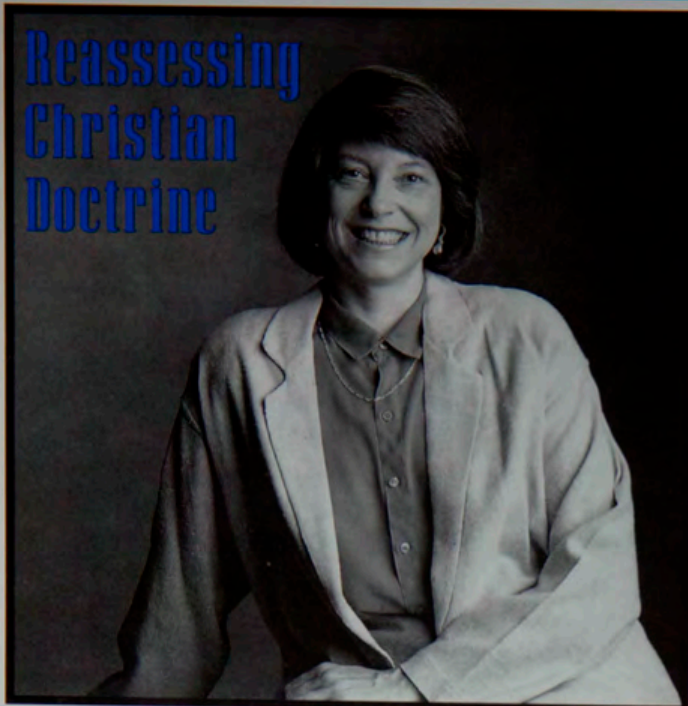
Land of Hope and Glory, published by the University of North Texas Press, features a character who appears as "The Great Man" in the previous books. Based on the life of Terry's great uncle, also Marshall Terry, the book tells the story of Marcus Aurelius Northway, a homeopathic surgeon who practiced at the turn of the century in upstate New York, and his wife, Ida. The novel follows Northway throughout his twilight years in his 70s and 80s as he reflects on his life and career. Terry plans to write two more books in the series; the next novel will feature the other side of his family and how they fit into Civil War America.

Terry is an award-winning author of five novels and a collection of short stories, as well as a critic, historian, and essayist. *Tom Northway* was co-winner of the Texas Institute of Letters' Jesse H. Jones Award in 1968. His short story "The Anticrist" won the TIL Short Story Award for 1972. In addition, *My Father's Hands* received the Dallas-Fort Worth Golden Pen Award in 1992.

Terry earned B.A. and M.A. degrees with departmental distinction from SMU. A teacher and administrator at SMU for more than 40 years, he authored the Master Plan for the University in 1963 and led undergraduate curriculum studies in 1980 and 1996. He has twice chaired the English Department and founded the Creative Writing Program and the SMU Literary Festival.



Reassessing Christian Doctrine



BY APPLYING HER EXPERIENCE AS A PARENT TO THE READING OF CLASSICAL CHRISTIAN TEXTS, THEOLOGIAN ELLEN T. CHARRY HAS CONCLUDED THAT MODERN ACADEMIC THEOLOGY HAS MISUNDERSTOOD CHRISTIAN DOCTRINE BY FAILING TO TAKE INTO ACCOUNT ITS FUNCTION AS AN INSTRUMENT OF MORAL PEDAGOGY. ❖ HER LATEST WORK, *BY THE RENEWING OF YOUR MINDS: THE PASTORAL FUNCTION OF CHRISTIAN DOCTRINE*, ARGUES THAT CHRISTIAN THEOLOGIANS FROM PAUL TO CALVIN "HAVE BEEN CONCERNED WITH THE KIND OF PEOPLE CHRISTIANS CLAIM GOD CALLS US TO BECOME," SHE SAYS. THE WORK WILL BE PUBLISHED IN APRIL BY OXFORD UNIVERSITY PRESS. ❖ SHE IS DEVELOPING A SEQUEL, *ON NEEDING GOD: CHRISTIAN COMMENTS ON THE SECULAR SELF*. "MODERN THOUGHT GENERALLY HAS BEEN CRITICAL OF CHRISTIAN THEOLOGY WITH ITS INSISTENCE THAT WE NEED GOD, NOT BECAUSE WE NEED HELP IN COPING WITH LIFE'S STRESSES, BUT BECAUSE WITHOUT DIVINE GUIDANCE WE TRIP OVER OURSELVES," SHE SAYS. THE SEQUEL WILL TURN THE CRITICISM AROUND TO ASSESS THE MODERN SELF FROM A CHRISTIAN PERSPECTIVE. ❖ CHARRY, ASSISTANT PROFESSOR IN PERKINS SCHOOL OF THEOLOGY, ALSO IS EDITING A TEXTBOOK FOR BLACKWELL PUBLISHERS. ❖ CHARRY'S RESEARCH HAS BEEN SUPPORTED BY FOUNDATION GRANTS, INCLUDING A HENRY LUCE FELLOWSHIP THROUGH THE ASSOCIATION OF THEOLOGICAL SCHOOLS. BEFORE JOINING PERKINS IN 1992, SHE WAS A MEMBER-IN-RESIDENCE AT THE CENTER OF THEOLOGICAL INQUIRY IN PRINCETON, NEW JERSEY. SHE HAS DEVELOPED INTERNATIONAL PROGRAMS IN INTERFAITH REFLECTION THROUGH THE NATIONAL CONFERENCE OF CHRISTIANS AND JEWS. ❖ CHARRY, WHO TEACHES SYSTEMATIC THEOLOGY, IS A RECIPIENT OF A 1996 GOLDEN MUSTANG AWARD FOR THE ADVANCEMENT OF TEACHING AND LEARNING. SHE EARNED THE M.A. AND PH.D. DEGREES FROM TEMPLE UNIVERSITY.

Drive-By Data: Professor Searches For Solid Ground In Mobile Computing

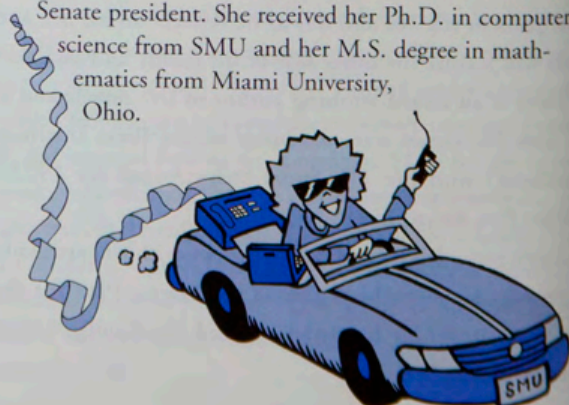
Computer scientist Margaret H. Dunham wants to know how an individual can efficiently use a laptop to retrieve data from data bases while riding in a car, all at the same time. The associate professor of the Department of Computer Science and Engineering is conducting research in the field of mobile computing to better understand how to maintain current data for laptop computers.

"We're studying problems about how to access data on fixed network machines – conventional computers – from mobile computers," she says. "Say someone has a laptop and is driving around. When a user at a laptop requests information from a data base, response for this query goes back to the laptop, which isn't where it was. How do we route the result back to the user when the user has moved?"

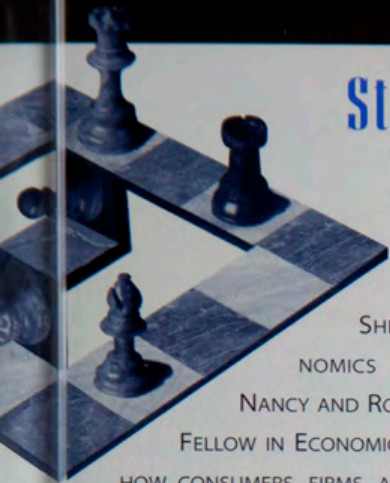
Dunham discusses a mobile transaction model in an article in the spring 1997 issue of *ACM/Baltzer Journal on Special Topics in Mobile Networks and Its Applications*. Another article, "Mobile Computing and Data Bases: Anything New?," written with Abelsalam Helal, appeared in the December 1995 *SIGMOD Record*.

Dunham also is conducting research in distributed data bases, a project that is funded by the Department of Defense. She is implementing a prototype environment for a performance test of an algorithm for Massive Digital Data Systems, which handles "large amounts of data that have come in quickly from many sites that must be processed and made sense of quickly," she says. She is trying to make recovery to a consistent state of data more efficient.

Dunham, who joined SMU's School of Engineering and Applied Science in 1984, serves as the 1996-97 Faculty Senate president. She received her Ph.D. in computer science from SMU and her M.S. degree in mathematics from Miami University, Ohio.



Strategies For The Game Of Economics



SHLOMO WEBER LIKENS ECONOMICS TO A GAME. WEBER, THE NANCY AND ROBERT H. DEDMAN RESEARCH FELLOW IN ECONOMICS, APPLIES GAME THEORY TO

HOW CONSUMERS, FIRMS, AND COUNTRIES FORM COALITIONS OR STRATEGIC ALLIANCES THAT PROMOTE THEIR INDIVIDUAL GOALS. HE DESCRIBES GAME THEORY AS "THE STUDY OF STRATEGIC INTERACTIONS AMONG PARTICIPANTS IN ANY CONFLICT SITUATION" IN A BOOK THAT HE IS PREPARING FOR OXFORD UNIVERSITY PRESS.

GAME-THEORETICAL MODELS, WHICH HAVE MUSHROOMED OVER THE PAST 20 YEARS, ARE USED IN NUMEROUS WAYS, SUCH AS DISCOVERING REASONS FOR NATURAL RESOURCE DEPLETION; CHANGING INTERPRETATIONS OF LABOR STRIKES, LOCKOUTS, AND ARBITRATION; AND DETERMINING WHY THE SAVINGS AND LOAN INDUSTRY COLLAPSED.

WEBER ALSO HAS CONDUCTED RESEARCH ON STRATEGIC ALLIANCES AMONG CORPORATIONS AND THE TYPE OF ALLIANCES THEY SHOULD FORM. IN ADDITION, HE HAS ANALYZED THE BEHAVIOR OF INCUMBENT PARTIES IN ELECTORAL RACES, ESPECIALLY HOW THEY SELECT THEIR PLATFORMS IN ANTICIPATION OF THE ENTRY OF A THIRD-PARTY CANDIDATE. HIS CURRENT RESEARCH INTEREST INCLUDES THE ECONOMIES OF THE REPUBLICS OF THE FORMER SOVIET UNION.

WEBER JOINED SMU IN 1992 AND HAS BEEN SERVING AS CHAIR OF THE ECONOMICS DEPARTMENT AND DIRECTOR OF THE RICHARD B. JOHNSON CENTER FOR ECONOMIC STUDIES SINCE 1994. A NATIVE OF RUSSIA, HE EARNED A MASTER OF SCIENCE DEGREE *CUM LAUDE* IN MATHEMATICS FROM MOSCOW STATE UNIVERSITY AND A PH.D. FROM THE HEBREW UNIVERSITY IN JERUSALEM. HE ALSO HAS SERVED AS A PROFESSOR OF ECONOMICS IN CANADA, EUROPE, AND ISRAEL. AMONG HIS HONORS ARE THE ALEXANDER VON HUMBOLDT FELLOWSHIP IN GERMANY AND THE CASSA DI RISPARMIO PROFESSORSHIP IN VENICE.

WEBER HAS PRESENTED HIS RESEARCH AT HARVARD, STANFORD, YALE, LONDON SCHOOL OF ECONOMICS, RENÉ ROY SEMINAR IN PARIS, HITOTSUBASHI UNIVERSITY IN JAPAN, AND NUMEROUS OTHER UNIVERSITIES THROUGHOUT NORTH AMERICA, EUROPE, AND ASIA. HE HAS PUBLISHED MORE THAN 50 ARTICLES IN A VARIETY OF PROFESSIONAL JOURNALS, INCLUDING *ECONOMETRICA*, *JOURNAL OF ECONOMIC THEORY*, *RAND JOURNAL OF ECONOMICS*, AND *JOURNAL OF INTERNATIONAL ECONOMICS*. HE ALSO HAS CONTRIBUTED ARTICLES TO KNIGHT-RIDDER FINANCIAL NEWS.

Digging The Ancients

Archaeologist David Freidel digs around in the closets of distant ruins looking for the skeletons of an ancient people.

For 22 years, the SMU professor of anthropology has conducted research on Mayan ruins in Mexico's Yucatan Peninsula. Since 1993, an archaeological team led by Freidel has been uncovering artifacts and skeletons in tombs at Yaxuna, Mexico. Evidence from building excavations at the site reveals that the city was a Maya royal capital by the fourth century A.D.



The digs have revealed that a wooden palisade fortifying a massive acropolis in the northern part of the ancient city probably was destroyed in battle with neighboring Chichen Itza during the ninth century, but archaeologists have not yet confirmed this. "Another great discovery has been a secret corridor found inside a fifth-century pyramid in the same northern acropolis," Freidel says. The corridor has been blocked with rough stone and fine dirt, but he hopes the team will be able to clear it out and possibly discover a royal tomb.

Because this type of excavation is a slow and painstaking process, the Yaxuna site has not been officially opened to the public, though visitors adventurous enough to travel the dirt road from Chichen Itza are welcome. However, Freidel hopes the site will be conserved as a historical park some time later this year and operated by Maya descendants who live nearby and farm the land around the ruins. They have worked with the archaeologists in the ruins for nearly a decade.

After the site has been opened to the public, the research will continue to be conducted by the National Institute for Anthropology and History and will be a collaborative effort with Mexican archaeologists from the Institute and the University of Yucatan.

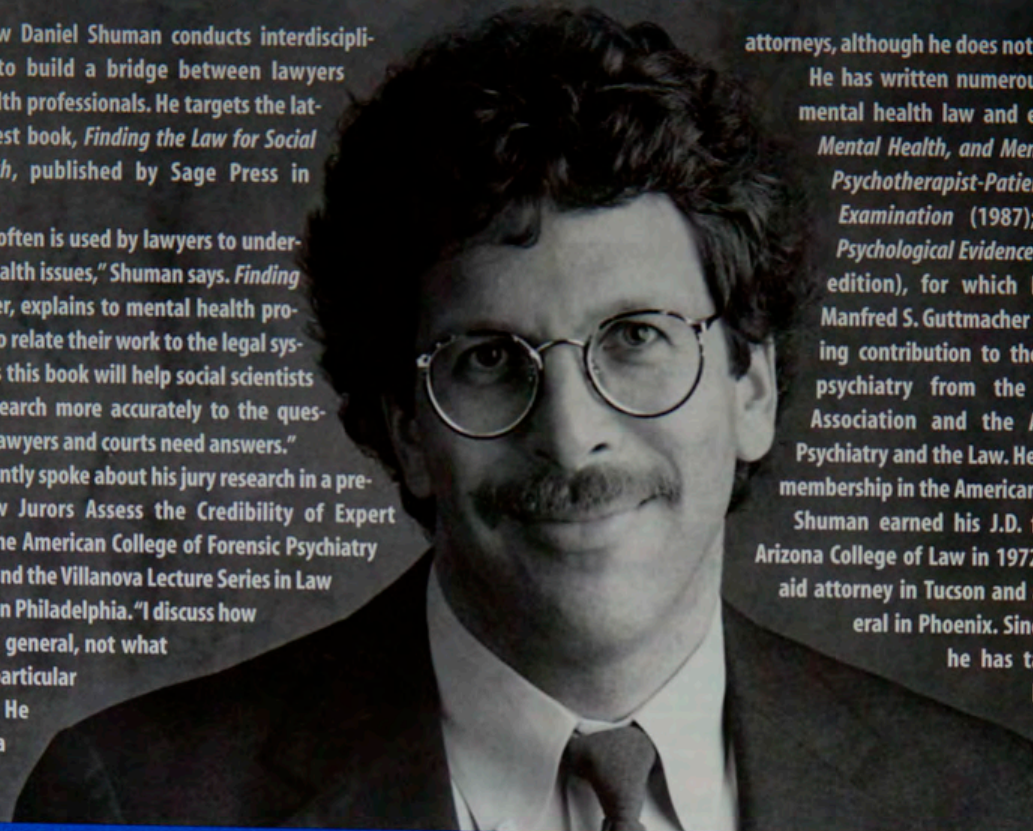
Freidel, who earned a Ph.D. from Harvard University, has taught at SMU since 1974. He is the co-author of three books, two of them with University of Texas professor Linda Schele: *Forest of Kings*, a study of Maya political history, and *Maya Cosmos*, about the long-term continuities between Maya experience and practices of contemporary Mayan people.

Crossing Disciplines, Merging Professions

Professor of Law Daniel Shuman conducts interdisciplinary research to build a bridge between lawyers and mental health professionals. He targets the latter with his latest book, *Finding the Law for Social Science Research*, published by Sage Press in December 1996.

"My writing often is used by lawyers to understand mental health issues," Shuman says. *Finding the Law*, however, explains to mental health professionals how to relate their work to the legal system. He believes this book will help social scientists "tailor their research more accurately to the questions for which lawyers and courts need answers."

Shuman recently spoke about his jury research in a presentation, "How Jurors Assess the Credibility of Expert Witnesses," to the American College of Forensic Psychiatry in New Orleans and the Villanova Lecture Series in Law and Psychology in Philadelphia. "I discuss how jurors behave in general, not what they did in a particular case," he says. He also serves as a consultant to



attorneys, although he does not testify in court cases. He has written numerous articles and books on mental health law and evidence, including *Law, Mental Health, and Mental Disorder* (1996); *The Psychotherapist-Patient Privilege: A Critical Examination* (1987); and *Psychiatric and Psychological Evidence* (1986 and 1994, second edition), for which he received the 1988 Manfred S. Guttmacher Award for the outstanding contribution to the literature on forensic psychiatry from the American Psychiatric Association and the American Academy of Psychiatry and the Law. He recently was elected to membership in the American Law Institute.

Shuman earned his J.D. from the University of Arizona College of Law in 1972, and served as a legal aid attorney in Tucson and assistant attorney general in Phoenix. Since joining SMU in 1977, he has taught torts, evidence, law and social science, mental health law, and civil procedure.

Observing The Media's Balance Of Power And Responsibility

Two books and two national political conventions contributed to Phil Seib's event-filled campaign year, but he wasn't running for office.

Instead, he covered those who do, as well as those who cover those who do. • A professor of journalism in the Center for Communication Arts in the Meadows School of the Arts, Seib conducts research and writes about journalism ethics, which he describes as "journalistic responsibility that is comparable to journalistic power." •

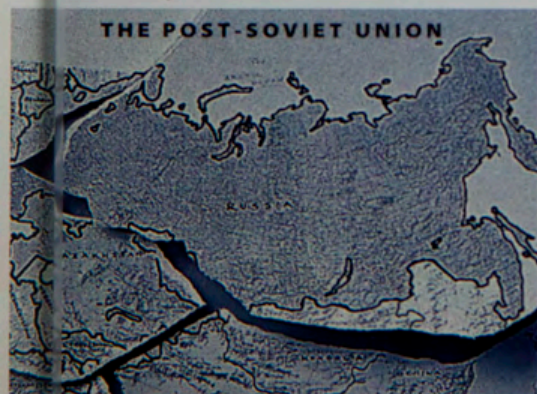
Seib also studies how the news media affect public policy. "There's constant interplay between the media and public policy," he says, adding that "policy makers should not allow themselves to be unduly influenced by the press. The key is finding a balance." • His eighth book, *Journalism Ethics*, co-authored with Assistant Professor Kathy Fitzpatrick, was published last year. Seib's ninth book, *Headline Diplomacy: How News Coverage Affects Foreign Policy*, was published in January. Seib also has written *Campaigns and Conscience: The Ethics of Political Journalism* (1994) and collaborated with Fitzpatrick on *Public Relations Ethics* (1995). • Seib's media experience, such as covering last summer's political conventions for WFAA-TV, provides him with what he calls a "constant stream of examples about the tests that journalists face in terms of ethics and of the influence that they wield."

He uses such examples in teaching TV news criticism, ethics, and media and politics. • Seib, an attorney who joined the faculty in 1982, is a contributing columnist to the Viewpoints page in *The Dallas Morning News* and a member of the faculty advisory committee of SMU's Maguire Center for Ethics and Public Responsibility. He earned an A.B. degree from Princeton University and a J.D. from SMU.



Past Creates Present Tension In Post-Soviet Society

As historian Daniel Orlovsky sifts through records in Moscow's archives, he is trying to understand social movements and bureaucracy and the relationship of the two to politics during Imperial, Soviet and present-day Russia. ♦ Orlovsky, history professor and chair of the William P. Clements Department of History, annually conducts research at the state and Communist Party archives, the latter of which were used to all foreign and numerous Soviet scholars before the late 1980s. He believes the Soviet past is strongly shaping post-Soviet Russia the nature of the so-called "market economy," and the process of building a democracy. "This Soviet past cannot be wiped away or simply rejected at will by an entire people. The past — its tragedies and achievements — must be understood," he says. ♦ Orlovsky, whose current research looks at the Russian revolution of 1917, is assembling a new collection of archival documents for the *Annals of Communism*, a book series that Yale University Press will publish this year. Another focus of his study is white-collar professionals, technical personnel, and other workers, and their roles in building the new Soviet state from 1918-1929. ♦ Other books include *Beyond Soviet Studies: Social and Economic History of Late Imperial Russia, 1861-1917*; and *The Limits of Reform: The Ministry of Internal Affairs in Imperial Russia, 1802-1881*. Orlovsky, the first recipient of the George A. Bouhe Research Fellowship in Russian Studies for Dedman College, is using the endowed fund to support his research. ♦ After receiving his Ph.D. in history from Harvard University, Orlovsky joined SMU in 1976. He was awarded a Fulbright-Hays Faculty Research Abroad Fellowship in 1989 and the Fund for Faculty Excellence and University Research Council grants in 1993. ♦ For his excellence in teaching and research, Orlovsky received the 1987 Laurence Perrine Prize, SMU's Phi Beta Kappa award.



DEREK BOX

Monitoring The Pulse Of Moral Theology

Charles E. Curran, the Elizabeth Scurlock University Professor of Human Values, compares his role as a moral theologian with that of a psychoanalyst who deals with human emotions. In moral theology, he says, "faith meets action and relates to contemporary existence; it raises questions of adequacy, consistency, and coherence for systematic and reflexive study."

Curran, an ordained Roman Catholic priest who joined SMU in 1991, has achieved international distinction for his research and published works with more than 40 books and articles. His latest work, which he co-edited, includes Feminist Ethics in the Catholic Moral Tradition: Readings and Moral Theology No. 2, published in October by Paulist Press.

In November Continuum Publishing Company published Curran's History and Contemporary Issues: Studies in Moral Theology. "This work studies the historical origins of issues such as medical ethics," he says, "and then points up some of the crises in contemporary Catholic moral theology, which were brought about by a growing difference between the official papal teachings and contemporary theological discussion."

In The Origins of Moral Theology in the United States: Three Different Approaches, which was published by Georgetown University Press in March, Curran argues for a diversity of approaches to moral theology during the 19th century, "a time when most contemporary scholars do not recognize the diversity that existed," he says. "No one has done any kind of historical work in this area at all."

Curran has served as president of three professional societies: the American Theological Society, Catholic Theological Society of America, and Society of Christian Ethics. He received a Doctorate in Sacred Theology from Academia Alfonsiana in Rome and was the first recipient of CTSA's John Courtney Murray Award for Distinguished Achievement in Theology.

Solving A Class Of Problems

Lawrence F. Shampine, the Betty Clements Professor of Applied Mathematics, recently completed a major project that developed methods and software providing the solution to a class of mathematical problems. The result will appear in two commercial products, MATLAB and SIMULINK.

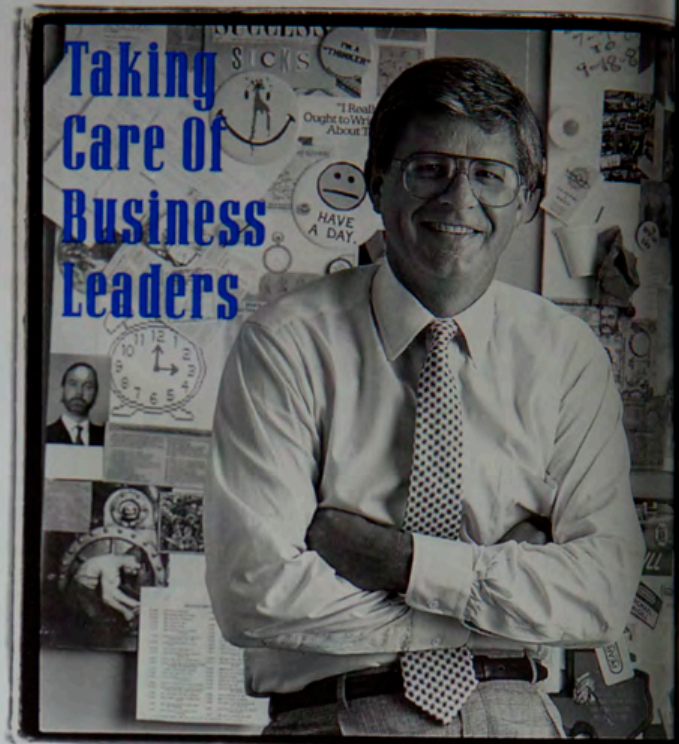
MATLAB is a computing environment that makes it easy to formulate, solve, and display a solution to scientific problems. SIMULINK is a simulation language that enables a scientist to describe problems in physical terms.

"This is one of the most high-visibility projects I've ever worked on," Shampine says. "This research and development work adds, or greatly improves, important capabilities of software that is in very wide use around the world."

The MathWorks Inc., a software firm in Massachusetts, began shipping the new versions of MATLAB and SIMULINK in November. Shampine worked as a consultant in collaboration with M.W. Reichelt on MathWorks' development staff. Preliminary versions of their programs have been downloaded more than 4,000 times from the Web site www.mathworks.com. Shampine attributes this interest to the programs' making it possible to solve problems that previously could not be solved. "People downloading the programs are quite literally all around the world. For scientific software, this is an extraordinary number of downloads," he says.

Shampine, who earned his Ph.D. from the California Institute of Technology, is the author of six books and more than 150 articles. His latest book, *Fundamentals of Numerical Computing*, co-authored with R.C. Allen Jr. and S. Pruess, was published by John Wiley & Sons in August 1996. He used the book in a 5000-level numerical analysis course at SMU this fall. It was adopted by a number of universities even though it was published only before the start of the semester.

Before joining SMU in 1986, Shampine spent 18 years at the Sandia National Laboratory in Albuquerque where he played a key role in the development of one of the first libraries of mathematical software. He received the 1992 University Scholar/Teacher of the Year Award from the Board of Higher Education and Ministry for the United Methodist Church.



Leadership on the battlefield may lead to victory, but leadership in less-epic settings tends to take place in a vacuum. That's the premise for "A Little Leadership, Please," an article that SMU business professors Michael McGill and John Slocum have submitted to *Harvard Business Review*. ■ "The idea," McGill says, "is that the popular approaches to leadership today are of a nature that discourages people from doing the things that leaders need to do." ■ Professor and chair of the Department of Organizational Behavior and Business Policy and interim dean of the Edwin L. Cox School of Business, McGill conducts research on organizational change and effectiveness and corporate leadership. He contends that "most current [leadership] models take on heroic proportion – when you talk about Colin Powell or Norman Schwarzkopf as leaders. The ways we're thinking about leadership are so large that they intimidate and frustrate rather than activate. The central problem we address in the article is how everyday people in common situations can exercise some leadership and move things forward effectively." ■ McGill and Slocum, the O. Paul Corley Professor of Organizational Behavior and Business Policy, also collaborated on the book *The Smarter Organization* (1994), which looks at the characteristics of successful businesses. ■ McGill earned his Ph.D. from the University of Southern California and joined the SMU faculty in 1971. He has served as a city planner and as a consultant to the public administration division of the United Nations.

$$\frac{d^2 b}{dt^2} = -g$$



Building A Better Platform

Developing a boron-containing catalyst that can be used in making high-quality polymers is like "building a platform with the perfect foundation," says Professor of Chemistry Narayan S. Hosmane. His research focuses on how to make the catalyst economically feasible, nontoxic, and easily and consistently reproducible.

One of the most practical uses of boron occurs in carborane compounds, a combination of boron and carbon molecules. Researchers use carboranes in their attempts to find a cure for cancer, especially brain tumors, and to manufacture very high temperature-resistant tiles for space shuttles. Boron also is used as a doping agent in batteries.

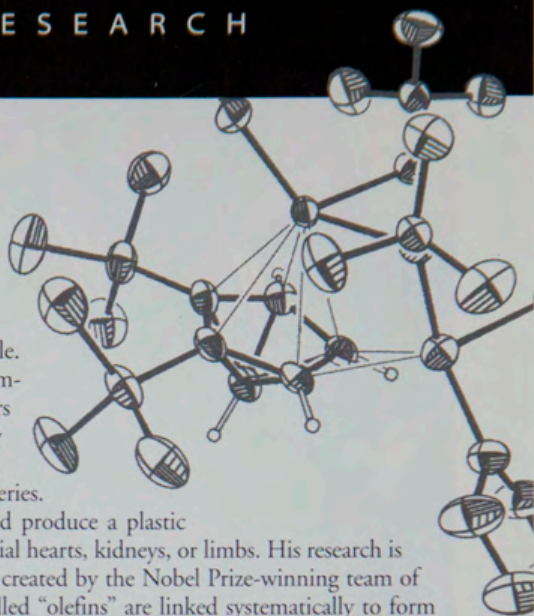
Hosmane is developing a boron-containing catalyst that would produce a plastic with metal-like properties, and which could be used to make artificial hearts, kidneys, or limbs. His research is furthering the development of the "olefin polymerization process" created by the Nobel Prize-winning team of Karl Ziegler and Giulio Natta. In this process, small molecules called "olefins" are linked systematically to form the most orderly plastic-like molecule. Hosmane is trying to develop this molecule.

Because industries foresee enormous commercial possibilities for the plastic, Hosmane says, they provide the funding for this type of research. Hosmane also is trying to create a compound with a large number of stable boron atoms that can be used more efficiently in cancer research, the stabilization of metals, and electricity conduction.

Hosmane received the 1994 Camille and Henry Dreyfus Teaching-Scholar Award and has been honored with the Mother India International Award for his research on bonding organic and inorganic compounds. The latter award is presented to individuals of Indian heritage who have made significant contributions to society.

Hosmane, who has published more than 100 articles on boron compounds, joined SMU's Chemistry Department in 1982. Since then, almost \$1.3 million in grants have supported his research projects; in addition, 23 postdoctoral research associates, five Master's degree candidates, one doctoral student, and 31 undergraduates have worked on various boron projects.

Born in Gokam, India, Hosmane received his B.S. and M.S. degrees from Karnatak University in Dharwar, India, and his Ph.D. from Edinburgh University in Scotland. A fellow of the Royal Society of Chemistry and the American Institute of Chemists, he has been listed in *Who's Who in the World*.



Increasing Helicopter Safety To Prevent Sleeping At The Wheels

Thousands of dollars and numerous lives may depend on the outcome of Osi Nwokah's research.

Nwokah, chair of the Department of Mechanical Engineering in the School of Engineering and Applied Science since 1994, researches methods of increasing flight safety in helicopters and decreasing cost of aircraft engines. To obtain the answers, Nwokah says, he merges the disparate methodologies of design and control engineering. "For 30 years there was no merger, because control engineering is extremely mathematical and abstract. But everything we do in engineering essentially ends up in design," he says, and control engineering proved to be a source of guiding principles to enhance flight.

"The most difficult aircraft to fly is the helicopter," Nwokah says. "The pilot is busy all the time. If pilots have been flying in war conditions or into a natural disaster, they get extremely fatigued and their reactions become very unsafe." The goal of one of his research projects is to combat this fatigue through the development of an autopilot system that will observe aircraft functions. The system would take over these observa-

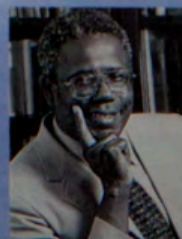
tions, giving pilots more time to concentrate on safety.

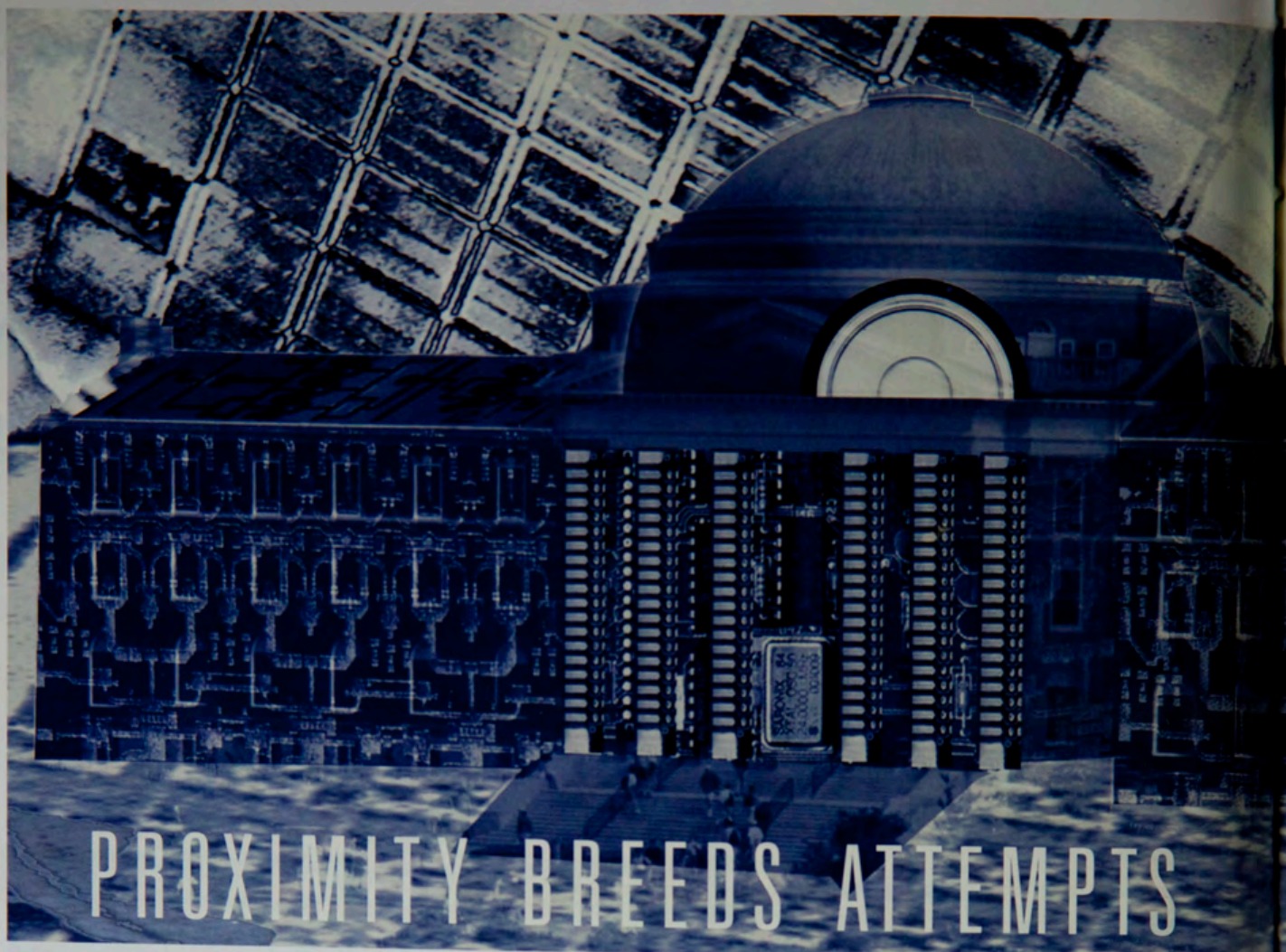
The cost of such research is prohibitive, however. A two-hour experiment with aircraft engines can cost \$250,000, which is why tests are conducted with agencies like NASA. Nwokah's research is funded by five grants – two from NASA and one each from the U.S. Air Force, General Electric, and the National Institutes of Science and Technology. He will present his observations in the paper "Catastrophes in Optimal Controllers" in June to the American Control Conference in Albuquerque.

In addition, Nwokah conducts research on the dynamics and control of high-performance gas turbine engines, as well as the modeling and control of high-accuracy, high-speed machining and other manufacturing processes. He is studying how to maintain a competitive edge by doing things cheaper, faster, and more accurately without the loss of reliability.

G.S. Happawana, a visiting mechanical engineering professor from Purdue University, works with Nwokah on these projects at SMU.

A native of Nigeria, Nwokah graduated with honors from the University of Leeds in England, and received advanced degrees from the University of Manchester, University of Toronto, and University of London (Imperial College). He served on the faculties of the University of Nigeria, Manchester Polytechnic, University of Manchester, Notre Dame, and Purdue before joining SMU.





PROXIMITY BREEDS ATTEMPTS

SMU and Texas Instruments forge research relationships that connect the academic with the hands-on

BY DEBORAH WORMSER

In an old TV comedy, a high school student assures Dobie Gillis that he will fall for her because they sit together in class, and proximity will overcome all resistance.

Proximity has the potential to strengthen the bond between SMU and Texas Instruments, says Nathan Dodge ('63 BSEE), TI's director of university research. TI's headquarters is situated on Central Expressway (I-75) about nine miles north of SMU.

"I have what I call the U.S. Highway 75 program," Dodge says. "We have many contracts with research universities throughout the United States, but I want to promote activity between SMU, the University of Texas at Dallas, and TI. They are convenient schools for partnering because we can drive only 10 minutes to a researcher's office to discuss the work."

Creativity and good timing also help, as well as scientists who are conducting cutting-edge research that has immediate applications in

industry, says Larry Smith, SMU's director of research administration.

TI's research funding support for SMU's School of Engineering and Applied Science totaled \$144,300 in the 1994-95 academic year and nearly doubled to \$240,000 in 1995-96. "It will be considerably greater in 1996-97, and I'd like to think it's the beginning of a trend," Smith says. SMU received \$9.5 million in external funding for 1995-96, with nearly \$900,000 from corporations. TI led the list of corporate sponsors.

Funding for such corporate-academic partnerships begins at the personal level between faculty and company researchers. "I think the funding follows the relationship," Smith says, "and it has to be one in which our goals support each other."

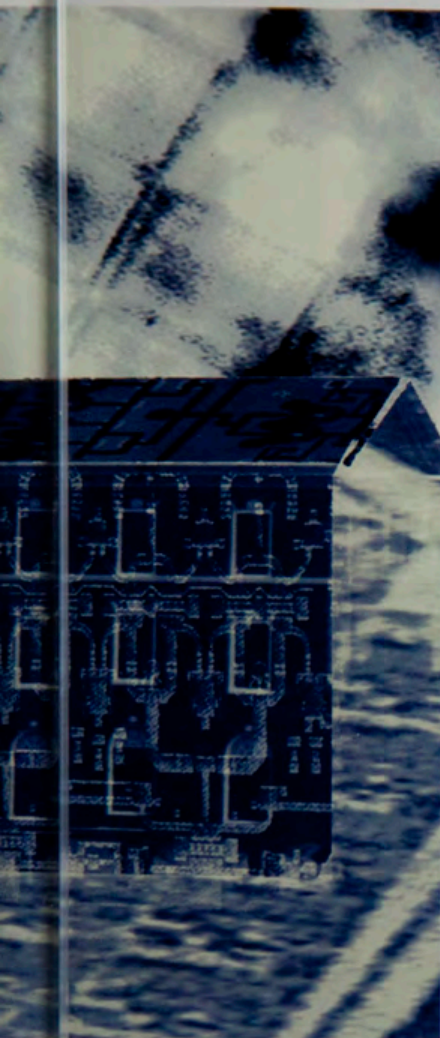
In SEAS' Electrical Engineering Department, Professor Mandyam Srinath's research on evaluating automatic target recognition (ATR)

systems grew out of a long-term relationship with TI. Although Srinath had worked on a similar TI project in 1982, he later moved on to others. More than a decade later, when TI engineers wanted a fresh perspective on the ATR problem, they thought of Srinath.

Srinath is trying to develop a statistical model to evaluate the performance of competing ATR systems. The model would greatly reduce the cost of developing and testing these complex systems, which are used in target tracking and recognition.

"His work is important, particularly with the 'smart' missile technology that we have today," Dodge says. "We want a missile that's smart enough to identify a target such as a tank, even if it's partially hidden behind a tree, for example."

Working with TI, Srinath says, gives SMU researchers and students an opportunity to tackle actual engineering problems. Dodge believes the benefits are mutual.



University of Texas at Austin. Many TI employees attended SMU as undergraduates, while others "attended" SMU through the Texas Association for Graduate Engineering Research (TAGER) microwave system that links the University to distance learning centers. TAGER students usually work at TI full time and take classes via SMU's distance education program.

One current SMU-TI project began with the modern integrated circuit technology research conducted by TI employee James S. Wilson, a doctoral candidate in mechanical engineering and recipient of a 1996-97 TI Systems Group Ph.D. Fellowship. Wilson proposed that a unique numerical solution technique be developed to evaluate thermal models of microwave integrated circuits. The technique is being developed through a research partnership formed with his dissertation adviser, Associate Professor of Mechanical Engineering Peter Raad, and colleague Donald Price, TI senior member/technical staff and an adjunct professor and research associate at SMU.

In addition, Raad and Price have created a research program to support the numerical modeling with experimentally measured thin-film material thermal properties and integrated circuit junction temperatures. Modeling and experimentation must occur simultaneously, Raad says, because the thermal properties of the thin-film materials used in high-performance integrated circuits are unknown, and the capabilities of the novel modeling technique must be evaluated if it is to serve as a critical guide in the design of integrated circuits. Modeling the thermal behavior of circuits can dramatically reduce the design cycle time of highly complex electronic devices as well as correctly predict their reliability and assess their performance, he adds.

The National Science Foundation approved two proposals from Raad and Price for \$470,454 to fund acquisition of equipment and to begin collaborative efforts between SMU and TI. In addition, TI provided both direct cost-sharing and in-kind contributions for the research. Raad and Price are serving as co-principal investigators on the project, which has created a virtual team of university and industry experts who will help investigate the cutting-edge, multidisciplinary research problems. Funds also will be provided to support a variety of TI engineers, who will serve as experts on various aspects of the project, including the measurements of the microwave integrated circuits' performance. TI also will provide electronic materials required to make the measurements. The University's proximity to the corporation will enable TI engineers to join researchers at SMU as often as the project requires.

In addition to developing this SMU-TI partnership, Dodge and Smith are forging research bonds in a new way. Instead of TI scientists approaching professors about specific problems, Smith solicited ideas from SMU researchers based on their current interests. One of the ideas, circulated among TI scientists for evaluation, was submitted by Raad, who described the research under way among Wilson, Price, and himself. Because several TI groups – integrated circuits developers who use exotic, thin-film materials for TI's semiconductor, telecommunications, and defense businesses – showed interest in the research, Raad's project was supported.

As a result, the level of TI support for the project has nearly doubled, and the collaboration between SMU and TI strengthened, which helped to ensure success for the proposals pending before the NSF. For his work, Raad received \$224,000 in 1996 from TI and will receive an additional \$36,000 in 1997. In addition, other organizations within TI have shown an interest in participating in the project.

"We are looking at this laboratory at SMU to serve as a center of support for TI's efforts, as well as other electronics and telecommunications industries in the Dallas-Fort Worth area," Raad says. "TI wants to locate this facility at SMU where it can be used to train future engineers and any group from TI can readily visit. TI is interested in benefiting itself, of course, but it also is interested in supporting education at SMU and in funding research that will benefit others in the electronics and telecommunications industries."

Computer Science and Engineering faculty member Frank Coyle began cleanroom software development research when TI employee Rob Oshana needed a project for one of Coyle's TAGER classes. Although "cleanroom" refers to the particle-free environment necessary to make flawless integrated circuits, in the software domain, cleanroom means defect-free software.

"The analogy is to produce high-quality software as it goes out the door rather than make revisions continuously based on problems that users find after they buy the programs," Coyle says.

The researchers combine stringent reviews before coding and statistical testing techniques to try to ensure defect-free software. "You can never test every statement and every branch in a software program," Coyle says. "There are too many; it might take you centuries. Decisions have to be made about what to test and what not to test."

Statistical testing is based on profiles of how

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"In American industry we are conducting less basic research, and we don't do enough long-term research," Dodge says. "One of the benefits of working with SMU professors is that they can research long-term technology issues that we don't have the resources to investigate."

Potential research partnerships often begin at professional meetings, where corporate and academic researchers can learn about each other's strengths and goals, Smith says. "Beyond that, relationships are formed by creating various working agreements and following up on them."

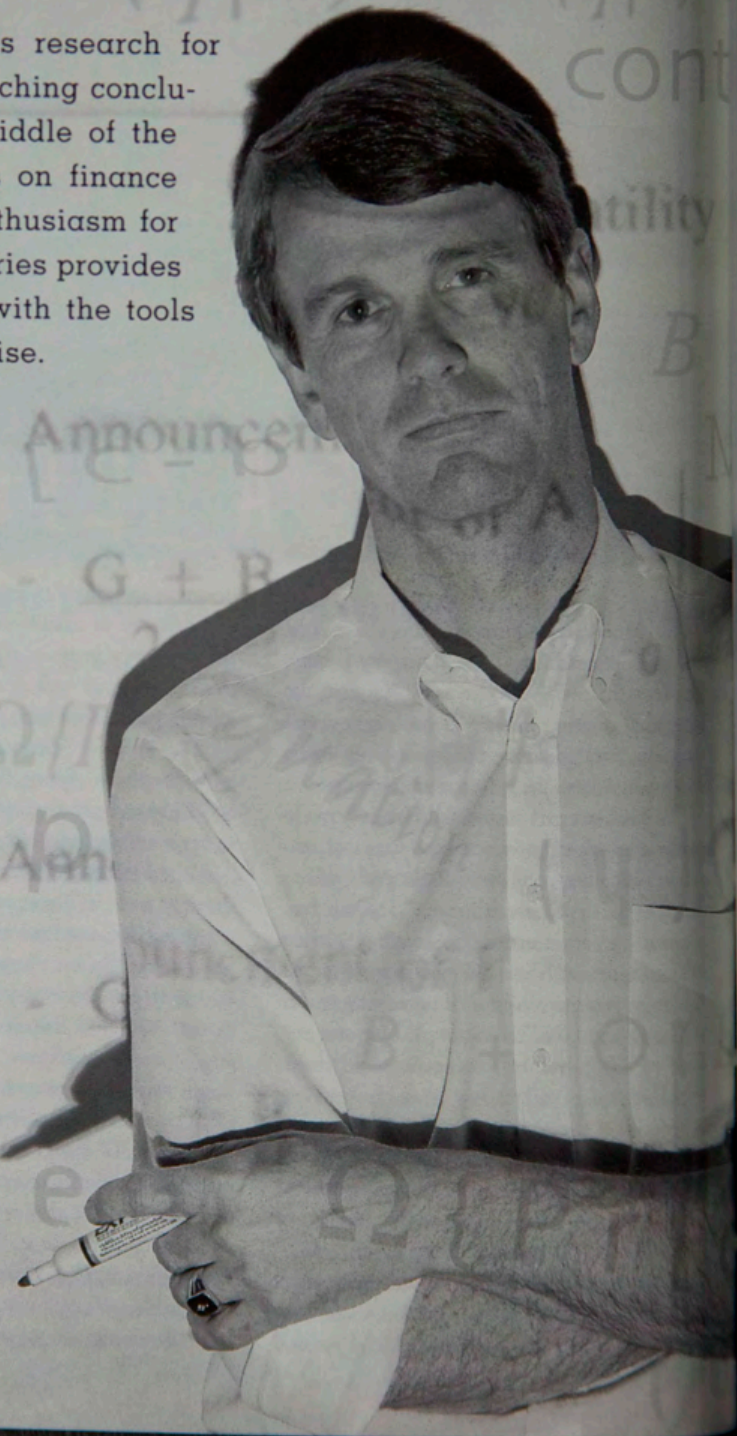
Dodge is responsible for administering grants and contracts for TI's corporate labs and for some of TI's subsidiary businesses, which have great leeway in allocating research monies. "Obviously, I foster these relationships wherever I can," he says. "These relationships, however, usually are developed researcher to researcher."

Other relationships begin in the classroom. TI's Dallas facilities employ more graduates of SMU than of any other university, including Texas A&M or the

A RESEARCHER'S RESEARCHER

There's Method In His Mathematics

Business Professor Rex Thompson conducts research for researchers. While others concentrate on reaching conclusions, Thompson serves as a link in the middle of the problem-solving process. With an emphasis on finance and accounting applications, Thompson's enthusiasm for developing mathematical models to test theories provides researchers at SMU and around the world with the tools that make their work more accurate and precise.



BY HELEN BOND

THOMPSON, THE COLLINS PROFESSOR of Finance and department chair and former associate dean of SMU's Edwin L. Cox School of Business, also provides students with the invaluable gift of teaching them how to think methodically. "I try to clarify how researchers should study certain kinds of business questions," he says.

In Thompson's office, a board stretched across one wall is filled with Greek mathematical notations. It is his latest project in its infancy, studying with Cox Assistant Accounting Professor Susan Riffe how best to use accounting information to predict stock prices.

Although previous research has considered the type of accounting information that should be used in a pricing model, Thompson and Riffe's work focuses on the importance of the method or functional model used to relate accurately accounting information back to stock price. They studied price, earnings, book value, and dividend data from more than 2,200 companies listed on the New York Stock Exchange to test their models against competing published methods of price prediction.

"Accounting information has a lot of measurement error, considering the way it is put together," Riffe says. "But we are still left with the quandary that we have to use this information to predict prices. We are thinking about the characteristics of accounting information, and given those characteristics, how we can use them in a prediction model to understand what the future price will be."

The research, which Thompson says may take as long as five years to yield results, is vital because of the proliferation of financial data that analysts now have at their fingertips. Before they can resolve the debate about which variables are important in predicting price, they first must identify a uniform and accurate model to relay this information. "Otherwise, you could incorrectly infer the importance of a variable," he says.

To further understand Thompson's role, he explains where he fits into the cycle of research. He divides finance researchers into three categories: Theorists develop models based on certain assumptions about financial markets. Scientists test these theories against actual events by collecting data on variables like economic growth and stock prices. Strategists such as Wall Street analysts are the practitioners, who study the theories and evidence to determine which are worthy to apply to business problems. Thompson's work falls between the theorist and scientist. He is interested in helping the scientist develop the appropriate method to uncover the most viable theories.

"If you can't differentiate among the theories

with meaningful tests, how do the strategists ever decide which theories to use?" Thompson asks. "The research is the vital link in the process and helps bridge the gap between pure theory and the strategists. Without that, there is chaos."

Thompson develops methods that have numerous applications and ultimately are the most useful. Because of the nature of his work, he usually collaborates with other researchers. His teaching and research interests cover not only empirical methodology in finance and accounting, but also capital market theory and evidence, and corporate finance.

Thompson also has worked with Riffe and Randolph Beatty, Distinguished Professor of Accounting, to explore valuation models used by expert witnesses in estate and gift tax valuation legal cases. Preliminary results from an unbiased valuation model that they developed suggest that market experts employ models that produce biased estimates of market values for publicly traded firms. The results could help judges and regulators identify and quantify any biases used in expert testimony in valuation cases.

Thompson has collaborated on dozens of papers and books and made numerous presentations on his work, including a model that predicts prices for initial public offerings, the debate over fixed versus adjustable-rate debt financing, and the relationship between teaching evaluations within the business discipline and an instructor's effectiveness. He also has consulted and provided testimony for corporations on issues from security market investments to the impact of corporate financial disclosures.

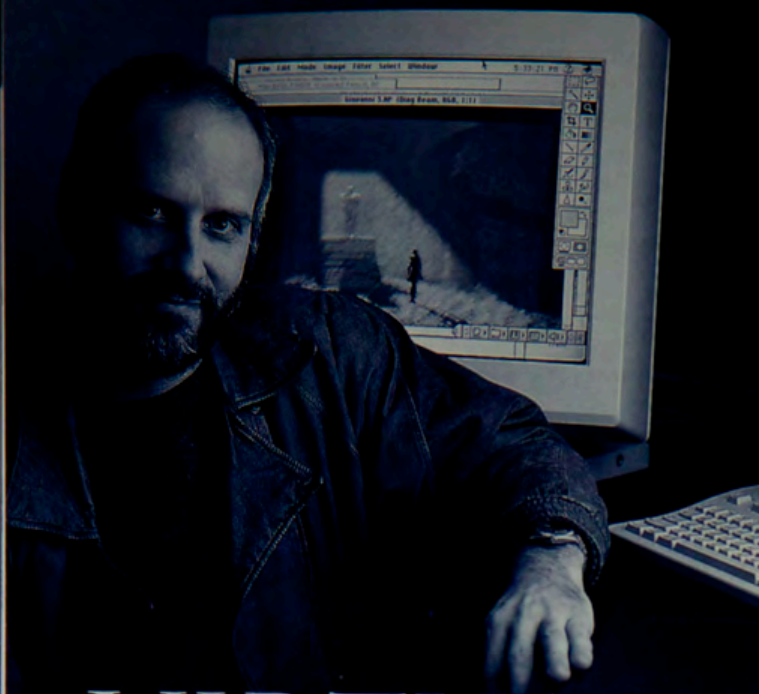
"He is an incredibly gifted thinker and is so good at finding creative ways to solve problems," Riffe says. "And he is willing to take the time to teach others about the insights he has."

Whether taking apart toys as a youngster or tinkering with old cars, boats, or mathematical models as an adult, Thompson has been fascinated with studying the inner workings of things. Some of this problem-solving passion evolved through his education. Thompson received his B.A. with distinction in economics from the University of Washington and an M.B.A. in finance from the University of Rochester, where he was first in his class. He later earned a Ph.D. from Rochester's Graduate School of Management.

Thompson began his academic career as an assistant professor at Carnegie-Mellon University. He later taught at the University of British Columbia and the Wharton School before joining SMU in 1988.

For Thompson, introducing the art of problem solving into the classroom requires patience

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VIRTUAL ARTS

Meadows professors

hone their craft with

the latest technology

By Kathleen Tibbetts

ART AND TECHNOLOGY Many have assumed that the two cannot exist in the same dimension.

But as computer applications grow more widespread and increasingly interdisciplinary, visual and performing artists and art historians are discovering new palettes with which to create their visions - and new media in which to share them.

Three years ago, Assistant Professor of Theatre David Jacques had his imagination piqued by a former graduate student who showed him some designs created with PhotoShop digital-darkroom software. Today, Jacques teaches courses in that application and others as part of the Meadows School's stage design program.

Jacques and Meadows Distinguished Visiting Professor Emeritus William Eckart created the stage design for Meadows' recent Noel Coward revue, "Cowardy Custard," entirely in PhotoShop. (Eckart learned to use PhotoShop in courses Jacques taught during the summer term.) The designers scanned photographs, composed images from them, and projected those images as slides onto three vertical panels behind the performers. To make the slides, the Center for Media and Instructional Technology loaned its new slide printer - a "camera in a box" that takes snapshots to standard film of images created in software applications.

In addition, Meadows stage design students use digital-darkroom and painting programs to design sets, lighting, and costumes. Designers work with photographs of walls, period doors or windows, furniture, clothing, even textures, and scenic artists paint those details directly onto the sets.

Students also work in three dimensions with a program called Strata. Starting with a rendering of one of SMU's theatres and a ground plan for the set itself, Strata allows the user to create 3-D representations on the computer screen. The program even enables the designer to place a virtual camera anywhere in the space to view the set from any angle.

For Jacques, a lighting designer, the program "not only allows you to place light sources, it shows you a very good representation of the highlights and shadows those sources will create," he says.

"In the past, designers had to create multiple copies of the same thing just to find out what would work," he adds. "This is especially problematic for costumes - once you paint a costume, you can't lift the paint away, and you have to throw it out. Digital technology allows designers to make changes quickly and cleanly in color, line, or volume - all before a board is measured or a paint can is opened. And once you finish a set, the scene shop can build it to the exact dimensions you plotted in your 3-D program."

DANCE IN 3-D

Three-dimensional rendering is a feature of another Meadows tool, a human-figure animation program known as LifeForms. The software is "very promising as an instructional tool," says Nathan Montoya, assistant professor in the Division of Dance. (Meadows is a test site for the application.) "It offers dance students, who often have very little exposure to technology, a different approach to their discipline," he says.

Students can choreograph for any number of bodies on a virtual stage they create, then turn in the assignment on a diskette. LifeForms files can be saved as QuickTime Movie, manipulated in a director program, or texture-mapped in a 3-D program. Montoya maintains a LifeForms link from his own home page (<http://www.smu.edu/~nmontoya>).

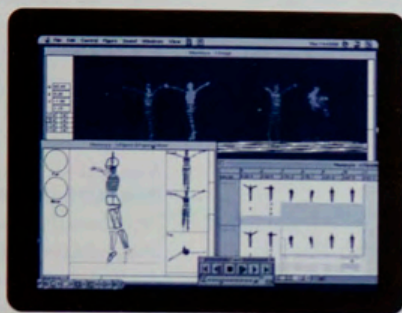
Dance Division members also use digital tools to help preserve great choreography. In 1996, in cooperation with the Martha Graham School of Contemporary Dance and the Dance Notation Bureau, the Division staged Graham's "Diversion of Angels" and helped record the entire work for future reconstruction. The result of this collaboration forms the basis for a prototype CD-ROM commissioned by the Graham Foundation. The project was funded by an Instructional Technology Grant from the Office of the Provost and a University Research Council grant.

Montoya, a former student of Martha Graham and a founding member of her Ensemble, is a certified teacher of both Martha Graham Technique® and Labanotation. He assisted Takako Asakawa, principal dancer for the Martha Graham Dance Company, in restaging the piece. Both had danced in the work at different times.

Drawing on video sources and their own memories, including their thoughts about Graham's original intent, Montoya and Asakawa accomplished the reconstruction with SMU students dancing the roles. Throughout the process, Leslie Rotman, director of reconstruction for the Dance Notation Bureau, took down every move in Labanotation, a movement equivalent of music notation developed early in the century by Rudolf von Laban. Using the LabanWriter software, students formatted pages and measures on Macintosh computers in preparation for incorporating the written notations. Montoya hopes that a dance group from the Dallas-Fort Worth area will stage the piece again from the finished score.

With the help of a multimedia shell developed at The Ohio State University, Montoya transferred a video record of the SMU performance produced by the Center for Communication Arts, the music score, and the Labanotation score into a CD-ROM using PhotoShop, Premiere (an audio-video development application), and the multimedia authoring tool Macromedia Director. All three elements were linked to run simultaneously in real time, a key factor for future reconstructions.

SMU's relationship with the Graham Company has set the stage for future collaborations in performance and preservation, not only in Dallas but at the University's Taos campus. "Taos would be especially appropriate," Montoya says. "Martha Graham was heavily influenced by that area, and some of her choreography is specifically derived from Southwestern culture and peoples."



WITH THE LIFEFORMS SOFTWARE, STUDENTS CAN CHOREOGRAPH ON A VIRTUAL STAGE.

THE ART OF THE WEB

Technology also has brought other cultures from around the world into SMU's classrooms. An example is the landmark Poggio Colla excavation in the Mugello Valley near Florence, Italy. SMU Art History Professor Gregor Warden and colleagues from Oberlin College have taken advantage of the latest technology to share their discoveries at this Etruscan settlement, which dates from the seventh to the third centuries B.C.E., and is believed to be the earliest and most informative site of its kind.

Faculty and students created a World Wide Web page for the excavation (http://www.oberlin.edu/~scarrier/Poggio_Colla/Intro.html) – almost as soon as digging began. They placed photos, text, and video footage on a CD-ROM, chronicling the 1995 season. The disc also includes a "tour" of the site, fifth-century tomb and its surroundings, which users can explore through video and virtual-reality programming. The CD was published by the University of Pennsylvania Museum, the United States' leading archaeological organization.

Appel Computers was so impressed with the CD that the corporation provided equipment to keep the excavation on-line for several summers. The project also benefited from the efforts of two Oberlin students, who joined the 1996 dig to work exclusively on digital communications. Their video photography shot during three different stages of excavation will form the basis of a new virtual-reality display for this season's CD-ROM.

Student archaeologists at Poggio Colla made a Net impact all summer, posting photos, keeping on-line diaries, and maintaining the Web site. In the future, Warden would like to organize on-line seminars linking several universities that would offer similar courses and share materials and discussion through e-mail and real-time conferencing software.

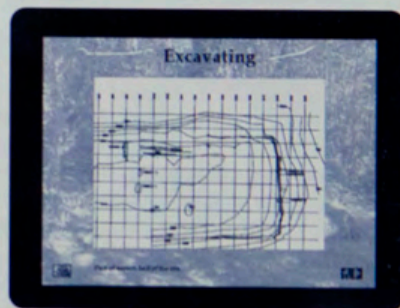
With the help of an SMU President's Partners Grant, which supports new ideas in teaching and research, Assistant Professor of Art History Christopher Fulton is exploring the Web's instructional possibilities. Fulton has created a Web site for his course on Northern Renaissance and Baroque art. The site includes a syllabus, vocabulary, test information, and more.

"In a typical art history textbook, most works are reproduced in black and white," Fulton says. "But on this page, students can study all the images in color, and many in detail." He plans to create a Web site for each semester and has collected about 1,000 images relating to several courses.

In the fall, Fulton divided his class into teams assigned to make their own contributions to the site, closed to all but the SMU community. Each team selected a topic – from the city of Amsterdam, to women artists, to navigation in Renaissance and Baroque art – and created a Web thesis using linked pages and scanned images. Fulton then integrated the student Web pages into the course's master page.

For Annemarie Weyl Carr's undergraduates, a similar on-line exhibition was a major assignment in her Byzantine Art class. Each student wrote a descriptive entry for a different object, and the photos and texts were linked together on a Web site. Not only did the students study for the final exam from one another's pages, they also wrote an essay on a topic that emerged from their "virtual museum." The experience of reading each other's work is a valuable teaching tool, Carr says. "Students have to take enough responsibility for what they write so other students can study from it."

In the course of exploring on-line resources, Carr has found that her own interests are not yet well represented. "As far as I can tell, there's not a great deal about the Byzantine Empire on the Web," she says. So, like many other Netsurfers, she's decided to create her own site. Carr and Ross Barclay of the Center for Communication Arts have applied for a grant to design a Byzantine site for a 14-part survey of the history of Greece being assembled by the Hellenic Cultural Foundation.



A MAP OF THE EXCAVATION AT POGGIO COLLA CAN BE FOUND ON THE WEB.

THE SOUNDS OF TECHNOLOGY

The Division of Music has been a leader in the use of technology within the Arts School. In 1993 the Division and the Computer Science and Engineering Department in the School of Engineering and Applied Science created the only dual-degree program in music and computer science offered in the Southwest. The Music Division also has incorporated technological components throughout its operations and in many degree programs.

Students provided much of the impetus toward using technology, says Division Chair Martin Sweidel. "More music students turn in homework that they've created with a music-printing software package," he says, and almost all have worked with computers using Musical Instrument Digital Interface (MIDI) technology. The Division now requires music education majors to take a one-credit workshop course in MIDI.

"Two of our recent music-composition graduates work for Sierra Online, creating original music for computer games," Sweidel says. "And they got the jobs because they knew and understood multimedia music formats and how to create sound and MIDI files."

Student-created Web projects such as the Meadows Percussion Ensemble home page (<http://www.smu.edu/~mpe/>) also provide opportunities for

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VARIOUS FACULTY MEMBERS FROM SMU'S SIX SCHOOLS PUBLISHED THE FOLLOWING SELECTED ARTICLES AND BOOKS IN 1995-96.

MICHAEL A. ADLER, Anthropology, *The Prehistoric Pueblo World, A.D. 1150-1350*, University of Arizona Press, 1996.

ALAN ALBARRAN, Communication Arts, *Media Economics: Understanding Markets, Industries and Concepts*, Iowa State University Press, 1996.

PATRICIA ANTHONY, English, *Cradle of Splendor*, Putnam/Berkeley/Ace, 1996.

WILLIAM S. BABCOCK, Theology, "Caritas and Signification in *De doctrina christiana* 1-3," *De doctrina christiana: A Classic of Western Culture*, eds. Duane W. H. Arnold and Pamela Bright, University of Notre Dame Press, 1995.

JOUETTE M. BASSLER, Theology, "Skeuos: A Modest Proposal for Illuminating Paul's Use of Metaphor in 1 Thessalonians 4:4," *The Social World of the First Christians: Essays in Honor of Wayne A. Meeks*, eds. L. Michael White and O. Larry Yarbrough, Fortress Press (1995): 53-66.

LEWIS BINFORD, Anthropology, "Francois Bordes: le grand typhon des études paléolithiques," *Archaeologists: A Biographical Encyclopedia*, ed. Tim Murray, Garland Press, 1996.

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DENNIS CORDELL, History, co-authored *A Social History of a Circular Migration System in West Africa*, Westview Press, 1996.

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JOHN C. HOLBERT, Theology, *Holy Rest, Holy Branches: Christian Preaching and the Old Testament*, Abingdon Press, 1995.

KENT HORNBOSTEL, Physics, co-authored "Precision Charmonium Spectroscopy from Lattice QCD," *Physics Rev.*, D52 (1995): 6519-6529.

NARAYAN S. HOSMANE, Chemistry, co-authored "A Systematic Synthetic Approach to the Formation of Mixed 2,3- and 2,4-C₂B₄-Erbium(III) Carborane Bent-Sandwich Complexes," *Organometallics*, 14 (1995): 1101-1103.

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FACULTY PUBLICATIONS

GREG GUFFMAN, Economics, co-authored "On the Existence and Uniqueness of Non-Optimal Equilibria in Dynamic Stochastic Economics," *Journal of Economic Theory*, 65 (1996): 611-623.

BLAKE IVES, Management Information Sciences, co-authored "Will the Internet Revolutionize Business Education and Research?" *Sloan Management Review* (Spring 1996): 33-41.

ROBERT V. KEMPER, Anthropology, "The Potentials and Problems of Computers," *Preserving the Anthropological Record*, eds. Sydel Silverman and Nancy J. Parezo, Wenner-Gren Foundation for Anthropological Research Inc. (1995): 205-217.

HIDEOKONISHI, Economics, "Equilibrium in Abstract Political Economics: with an Application to Public Good Economy with Voting," *Social Choice and Welfare*, 13 (1996): 43-50.

J.L. LAE, Mechanical Engineering, co-authored "Microscopic Heat Sink for Cooling Phased-Array Radar Systems," *International Journal of Heat and Mass Transfer*, 39 (1996): 3633-3647.

ANTHONY E. MARKS, Anthropology, co-authored "Views of the Crimean Middle Paleolithic: Past and Present," *European Prehistory*, 7 (1995): 59-80.

GEORGE MARTINEZ, Law, "The New Wittgensteinianism and the End of Jurisprudence," 29 *Loyola Los Angeles Law Review* 545 (1996).

ALEXIS MCCROSSEN, History, "Jesus and the Marketplace," *Harvard Divinity Bulletin*, 25, No. 1 (December 1995): 7-9.

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ACK MEERS, English, co-editor, *Leaning House Poetry*, Vol. 1, 1996. A CD-Anthology of seven national-known poets' work. The CD and text concept: a technological first in poetry publishing.

JAMES NAGY, Mathematics, co-authored "Iterative Image Restoration Using Approximate Inverse Preconditioning," *IEEE Trans. Image Processing*, 5 (1996): 1151-1162.

BETH NEWMAN, English, *Jane Eyre*, a critical edition including an essay by Newman, Bedford Books of St. Martin's Press, 1996.

JOSEPH JUDE NORTON, Law, "Syndicated Financings and Emerging Market Development: Prospects for Latin America," 2 *NAFTA: Law and Business Review of the Americas*, No. 3 (Summer 1996).

W. C. ORR, Biological Sciences, "Senescence: in search of causality," *Devel. Genet.* 18 (1996): 93-98.

THOMAS OSANG, Economics, "Do Closer Economic Ties Imply Convergence in Income? The Case of the U.S., Canada and Mexico," 1 *NAFTA: Law and Business Review of the Americas*, No. 4 (1995): 86-93.

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PETER RAAD and ADRIAN S. SABAU, Mechanical Engineering, "Blink-Induced Motion of a Gas Permeable Contact Lens," *Optometry and Vision Science*, 72, No. 6 (June 1995).

WILLIAM R. SCHUCANY, Statistical Science, "Adaptive Bandwidth Choice for Kernel Regression," *Journal of the American Statistical Association*, 90, 430 (1995): 535-540.

MARTHA A. SELBY, Religious Studies, "Desire for Meaning: Providing Contexts for Prakrit Gathas," *The Journal of Asian Studies*, 55, No. 1 (February 1996).

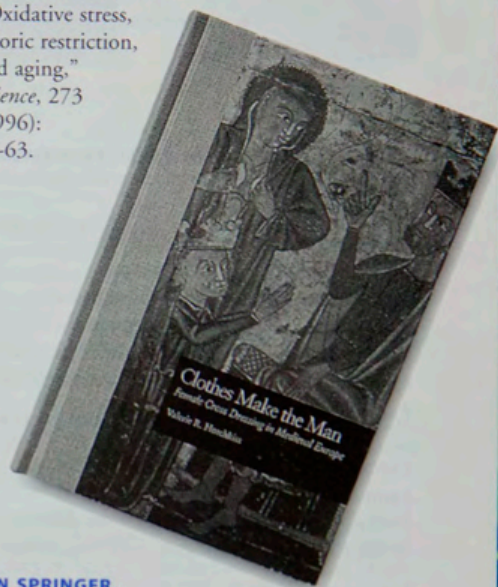
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T.J. SLITER, Biological Sciences, co-authored "Quantification of ecdysteroid biosynthesis during short-term organ culture," *Methods Enzymol.* 272 (1996): 292-304.

E. H. SMITH, Mechanical Engineering, "Removal of Cadmium, Zinc, and Lead from Wastewater Using Recycled Shot-Blast Fines," *Metal Finishing*, 93, 11 (1995): 13-25.

MARION G. SOBOL, Management Information Sciences, co-authored "Bias in Computer-Assisted Surveys," *IEEE Transactions on Systems, Man, and Cybernetics*, 26, No. 5 (September 1996).

R.S. SOHAL, Biological Sciences, co-authored "Oxidative stress, caloric restriction, and aging," *Science*, 273 (1996): 59-63.



KEN SPRINGER, Psychology, "How a naive theory of kinship is acquired through inference," *Child Development*, 66 (1995): 547-558.

WILLIAM TAYLOR, History, *Magistrates of the Sacred, Priests and Parishioners in Eighteenth-Century Mexico*, Stanford University Press, 1996.

DON VANDEWALLE, Organizational Behavior and Business Policy, "Psychological Ownership: An Empirical Examination of its Consequences," *Group and Organization Management*, 1995.

PETER WINSHIP, Law, "Current Development Concerning the Form of Bills and Lading - United States," *Ocean Bills of Lading: Traditional Forms, Substitutes, and EDI Systems*, 1995.

PATTY WISIAN-NEILSON, Chemistry, co-authored "Fluorinated Polyphosphazenes Derived from Poly (methylphenylphosphazene) and Fluorinated Aldehydes and Ketones," *Macromolecules*, 28 (1995): 8657.

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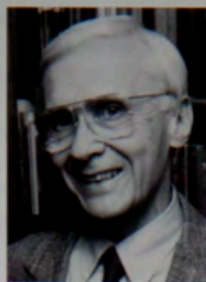
FACULTY RECOGNITION & AWARDS



BRETTELL



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HURMUZLU

THE FOLLOWING SMU FACULTY MEMBERS WERE RECOGNIZED FOR THEIR TEACHING, SCHOLARSHIP, OR RESEARCH DURING 1995-96.

JANIS BERGMAN-CARTON, Art History; **LOUIS JACOBS**, Geological Sciences; **JOSEPH JUDE NORTON**, Law; and **WILLARD SPIEGELMAN**, English, were honored for their outstanding research, publications, and teaching at the annual Godbey Lecture Series Authors' Award Luncheon in April.

CAROLINE BRETTELL, Anthropology, was named president of the Society for the Anthropology of Europe (under the auspices of the American Anthropological Association).

DONALD BUTLER, Electrical Engineering, is a recipient of the 1996 IEEE Outstanding Service Award for the Electron Devices Society-Dallas Section.

ZEYNEP ÇELIK-BUTLER, Electrical Engineering, received the Graduate Student Council Outstanding Faculty Award for the Electrical Engineering Department.

DALIA DANIEL, English, was awarded an honorary doctorate of literature from the World Congress of Poets, Governing Board of the World Academy of Arts and Culture, for her contributions to poetry.

VICTOR PAUL FURNISH, Theology, was honored with a Festschrift in New Orleans during a joint meeting of the Society of Biblical

Literature and the American Academy of Religion; the volume is titled *Theology and Ethics in Paul and His Interpreters: Essays in Honor of Victor Paul Furnish*, Abingdon Press, November 1996.

RICHARD F. GUNST, Statistical Science, has been elected to the board of directors of the American Statistical Association.

KATHY HAYES, Economics, has been appointed as one of four co-editors of *Southern Economic Journal*, 1997.

NARAYAN S. HOSMANE, Chemistry, was awarded the 1996 BUSA Award for Distinguished Achievements in Boron Science from the Awards Committee of Boron in the USA (BUSA) Workshop held in Guanajuato, Mexico.

YILDIRIM HURMUZLU, Mechanical Engineering, received the Control Systems Award from the IEEE-Dallas Section in April.

JOSÉ LAGE, Mechanical Engineering, received the 1995-96 Young Engineer of the Year Award from the North Texas Section of the American Society of Mechanical Engineers.

JOHN LOWE, Law, won the 1996 Texas Bar Foundation Outstanding Law Review Article

Award for "Defining the Royalty Obligation," 49 *SMU Law Review* 223 (1996).

CAROLYN SARGENT, Anthropology, is serving as secretary-treasurer of the Society for Medical Anthropology.

JOHN W. SLOCUM JR., Organizational Behavior and Business Policy, has been named editor-in-chief of a new journal, *Journal of World Business* soon to be published by JAI Press.

FRED WENDORF, Anthropology, is the 25th recipient of the Lucy Wharton Drexel Medal for Archaeological Achievement, which was established by the University of Pennsylvania Museum in 1889.

RITA KIRK WHILLOCK and **DAVID SLAYDEN**, Communication Arts, were honored in December for their 1995 book, *Hate Speech* (SAGE Publications), by The Gustavus Myers Center for the Study of Human Rights in North America. *Hate Speech* was named the Outstanding Book on the Subject of Human Rights in North America.

WAYNE A. WOODWARD, Statistical Science, was named a fellow of the American Statistical Association at its joint statistical meetings in August.



LAGE



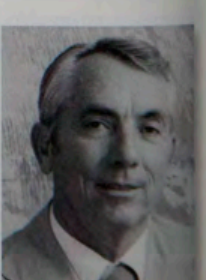
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SPONSORED RESEARCH

During 1995-96 sponsors awarded \$9,523,121 to SMU for direct and indirect costs of research and sponsored projects, a significant increase over the \$7,680,555 received in 1994-95.

Sources of funding were federal agencies, 70 awards, \$7,305,769 (76.7%); state and local government agencies, 8 awards, \$923,333 (9.7%); corporations, 1 award, \$898,396 (9.4%); foundations, 10 awards, \$270,310 (2.8%); and miscellaneous, 2 awards, \$125,313 (1.3%).

Denham College was awarded \$6,687,697 in 64 awards: Division III, Natural

Sciences, received \$5,425,072 in 48 awards; Division II, Social Sciences, \$1,193,325 in 14 awards; and Division I, Humanities, \$69,300 in 2 awards.

The School of Engineering and Applied Science received \$2,513,243 in 41 awards. The Edwin L. Cox School of Business received \$94,999 in 2 awards; the Meadows School of the Arts received \$13,286 in 2 awards; and the School of Law received \$60,799 in 1 award. Three other awards totaled \$153,097.

Of the 80 primary and co-project directors/investigators, the following had aggregate funding in excess of \$100,000:

JAMES BROWN, Political Science, \$154,933, "1995 Arms Control Conference," Army.

WEIDONG CHEN and **CHANGHWA (ERIC) LIN**, Computer Science and Engineering, \$234,052, "Mobile Computer Networking," Texas Higher Education Coordinating Board; **WEIDONG CHEN**, \$25,000, "Query Processing in Knowledge Base System," National Science Foundation.

THOMAS EDWARDS, Teacher Preparation, \$276,610, "Upward Bound," Department of Education.

GARY HANS, Electrical Engineering, \$99,230, "Integrated Silica-Glass Waveguide Coupled Wave-length Division Multiplexing Semiconductor Lasers," Texas Instruments Inc.; \$9,042, "Modeling and Optimization of 980 nm and 808 nm Laser Structures," Semiconductor Lasers International Inc.; \$11,500, "900nm Laser Structures," and \$48,864, "Development of 1.31 um and 1.51 um AlInGaAs Ridge Guide Lasers Operating up to 1 GHz," Laser Diode Inc.; \$7,576, "Compact Ultraviolet Laser Project," Electro Scientific Industries Inc.

HENRY GRAY, Statistical Science, and **GARY MCCARTOR**, Physics, \$178,080 and \$204,183, "Statistical Methods for Describing the Performance of Existing and Projected Processes for Association, Detection, Location, and Identification Algorithms," Air Force.

EUGENE HERRIN, Geological Sciences, \$362,386 and \$285,800, "Regional Discrimination Studies," Advanced Research Projects Agency; \$1,086,505, "Design Evaluation, and Construction of Two Nine-Element Experimental Mini-Array TEXESS and LUXES - Task 1," Advanced Research Projects Agency \$421,822, "Research in Mini-Array Technology and Use of Data from Single Stations and Sparse Networks - Tasks 2 and 3," Advanced Research Projects Agency; \$83,016, "Operate and Maintain the TEXAR array," Air Force; **EUGENE HERRIN** and **CHRISTOPHER HAYWARD**, \$29,918, "Pakistan Incremental Array," Science Applications International Corporation; \$83,156, "Mosaic Interface," Science Applications International Corporation; \$38,000, "WEB Development," Science Applications International Corporation; \$72,216, "Peleduy Arrays," Science Applications International Corporation.

ROBERT EDWARD and **MILTON GOSNEY**, Electrical Engineering, \$150,457, "Development of VLSI System for Improved Monitoring and Stimulating Action Potentials of Neuronal Networks," National Science Foundation.

RICHARD JONES, Biological Sciences, \$148,241, "Polycomb-group Genes and Gene Regulation," National Institutes of Health; \$39,773, "Telomere Organization and Aging," American Federation for Aging Research Inc.

JEFFERY KENNINGTON and **RICHARD HELGASON**, Computer Science and Engineering, \$100,000, "Shortest Path Algorithms on Grid Graphs with Applications to Strike Planning," Navy.

JEFFERY KENNINGTON and **SUKUMARAN NAIR**, Computer Science and Engineering, \$290,592, "Design Tools for Highly Survivable Sonet Networks," Texas Higher Education Coordinating Board; **SUKUMARAN NAIR**, \$10,000, "REU Supplement to Spectral-Based Numerical Methods for Combinational Logic Synthesis," National Science Foundation.

ALIREZA KHOTANZAD, Electrical Engineering, \$85,540, "Advanced ANNSTLF Host Utility Testing, Support, and Enhancements," Electric Power Research Institute; \$25,001, "Adaptive Fuzzy Process Control for Next Generation Wire Bonding," Texas Instruments Inc.

LAURA KING, Psychology, \$102,267, "Goals, Identity, Meaning in Life and Well-Being," National Institutes of Health.

MICHAEL LATTMAN, Chemistry, \$190,000, "Bond-Cleavage Reactions, Multi-Receptor Linking, and Novel Metal-Binding of Main-Group Elements," National Science Foundation; \$13,000, "Phosphorus-Containing Calixarenes for Use as Flame Retardants," DuPont de Nemours and Co.; \$25,000, "Hypervalent Main-Group Elements: New Structures and Reactions," American Chemical Society.

DAVID MATULA and **YANJUN ZHANG**, Computer Science and Engineering, \$185,510, "Design of a Next Generation Floating Point Unit for the x86 Architecture," Cyrix Corporation; **YANJUN ZHANG**, \$10,000, "Motion Estimation Techniques for MPEG Video Compression," Cyrix Corporation.

WILLIAM PULTE, Anthropology, \$154,533, "Master's Program Leading to Endorsement in Bilingual Certification," Department of Education.

PETER RAAD, Mechanical Engineering, \$25,000, "Thin Film Properties of Electronic Materials," and \$14,000, "Development of a Thin Film Thermal Properties Measurement Laboratory," Texas Instruments Inc.; \$54,160, "Study of Turbulent Flow

Methodologies, IR&D Project 1920," Chrysler Technologies Airborne Systems Inc.

PETER RAAD and **DAVID JOHNSON**, Mechanical Engineering, \$70,632, "Experimentally Verified Three-dimensional Free Surface Fluid Simulation," National Science Foundation; **DAVID JOHNSON**, \$63,135, "Dynamics and Control of Injection Molding Machines," Leadwell CNC Machines Manufacturing Corporation.

LAWRENCE RUBEN, Biological Sciences, \$159,707 and \$6,388, "Calcium Pathways in African Trypanosomes," National Institutes of Health.

R.S. SOHAL, Biological Sciences, \$60,969, and \$64,810, "Neurobehavioral and Immunological Markers of Aging," University of North Texas Health Science Center; \$138,276, "Cellular Aging and Oxygen Free Radicals" and \$177,820, "Dietary Modulation of Cellular Oxidative Stress in Aging," National Institutes of Health; \$3,000, "Glenn Foundation Summer Stipend Student," Glenn Foundation for Medical Research; **R.S. SOHAL** and **WILLIAM ORR**, \$212,416, "Antioxidant Enzymes and Aging in Transgenic Drosophila," National Institutes of Health; and **WILLIAM ORR** and **R.S. SOHAL**, \$44,000, "Relationship Between ALS-associated CuZn Superoxide Dismutase Mutations, Oxidative Stress and Loss of Motor Ability," ALS Association.

EDWARD SMITH, Mechanical Engineering, \$38,998, "Recycling of Waste Pallet Shot-Blast from Cast-Iron Manufacturing Processes," Tyler Pipe; \$173,360, "Removal of Heavy Metals from Industrial and Hazardous Waste Waters by Recycled Shot Blast Fines," Texas Higher Education Coordinating Board.

RYSZARD STROYNOWSKI and **GARY MCCARTOR**, Physics, \$95,000 and \$278,000, "Research in Experimental and Theoretical High Energy Physics," Department of Energy; **RYSZARD STROYNOWSKI**, \$9,500, "High Energy Physics," Department of Energy.

STEVEN VIK, Biological Sciences, \$151,216, "Structure-Function Studies of E. Coli F1F0 Atpase," National Institutes of Health.

FRED WENDORF, Anthropology, \$26,984, "An Archaeology Study of Emerging Social Complexity in the Eastern Sahara of Egypt," National Science Foundation; \$295,589, "Preservation in Sinai," American Research Center in Egypt Inc.

Compiled by Larry Smith, Director of Research Administration

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the software will be used, focusing on usage profiles to drive the testing effort. For example, if individuals more frequently use the cut-and-paste functions of a word processing program, software developers would run the most tests on that part of the program.

Another Coyle project, which evaluates techniques for forging software systems built from components written in different computer languages, evolved because TI researchers knew that he was interested in object-oriented and software component technology. Solving com-

*"FUNDING FOLLOWS THE
RELATIONSHIP ... ONE
IN WHICH OUR GOALS
SUPPORT EACH OTHER."*

munication problems between ADA, a standard language in military applications, and C/C++, another common computer language, would make off-the-shelf computer software a reality. Therefore, new computer software could be designed from existing modules, rather than be reinvented for each new application.

Once relationships are forged and the work is under way, the execution is all-important, Smith says. "You can't afford to be charitable when you are in business like TI. When the TI people assess a project, they look at how much they invested, the quality of the results, and the value of the intellectual property. They then determine whether it was a good investment."

Because of SMU's proximity, Dodge visits researchers on campus, which has led to a familiarity that may create additional collaborations. On a recent visit Dodge spoke with Computer Science and Engineering Professor Dan Moldovan about his work with a project that uses multiple digital signal processing (DSP) chips, which make multimedia computers possible. Moldovan's project - to build a parallel computer that will recognize written as well as spoken language - needs eight of the costly chips for each computer. On his next visit, Dodge brought along a gift - a box of 20 DSP chips that he purchased for Moldovan with TI's discount.

Such gestures foster solid working relationships and create research agreements that benefit both SMU and TI. "We are both members of this Dallas community," Smith says, "and it pays for us to be good neighbors and to work together." ●

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with students, who often care more about what the answer is, than how to get the answer. On any given day, he may give them a pep talk about the importance of learning.

"We are trying to learn how to think about the world here; forget about Goldman Sachs and Morgan Stanley," Thompson says. "I view my approach to this philosophically. Although I'm working in business, I'm fighting on the front of how do you think and solve problems."

Students view Thompson as an approachable teacher who always has time for them. When senior finance and psychology major Leigh Ann Schomburg and several former students from his Introduction to Finance honors course struggled with a financial issue on a case study for another class, Thompson spent more than an hour answering their questions.

"As a teacher, he challenges us to think analytically, to understand how the problems work and the concepts behind the solutions," says Schomburg, a teaching assistant for Thompson.

In one of Thompson's popular M.B.A. courses, the Practicum in Portfolio Management, he would use a report to show how an analyst arrives at a stock price, and then help students evaluate the report's pluses and shortcomings, particularly the methods of modeling.

Jim McGee, now in sales and marketing for the Dallas brokerage firm Capital Institutional Services, two years ago took the class in which students selected stocks for SMU's endowment fund. McGee's potential stock was a spin-off of a public pipeline company, but because it had been a subsidiary, little financial data were available and standard methodologies used to price stocks were of little value.

Thompson suggested that McGee use historical pricing information against earnings growth of the company's peer group to develop a pricing model. Under the new model, his stock was considered 30 percent undervalued. The class voted unanimously to purchase the stock at \$25, which was sold nine months later for \$45.

"He would show you the idea or logic behind things," McGee says. "Whatever the assignment, he would encourage you to take a swing at a problem and apply it on your own."

Although Thompson believes the link between financial data and theory is vital to his field, he sees a certain beauty in his work. "I view what I do as art," he says. "The research in which I choose to participate has a pattern that relates to thinking in a certain way. Of course, like all art, the eye is in the beholder. But I hope I'm making a contribution to the way the profession thinks about problems." ●

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Meadows musicians to develop their discernment concerning on-line information. "Right now, the Web doesn't separate fact from fiction, or the hacks from the professionals," Sweidel says. "You need to teach students not only how to access information, but how to make judgments about it."

Because many different audio formats can be used for Web creation, simply sorting through them is an education in itself. "When we work in the Electronic Music Studio, we get state-of-the-art, CD-quality sound," Sweidel says. "But when you make those files available through the Internet, you have to compress them into a form that will run on common-denominator computer platforms and be easy and quick to download. It requires a lot of expertise to understand what happens, how to preserve the sound quality, or what kind of equalization to use."

One of Sweidel's students, Chris Benge, is doing a directed-studies project on audio formats for the Web and multimedia as part of his work on a CD-ROM guide to SMU's Law School.

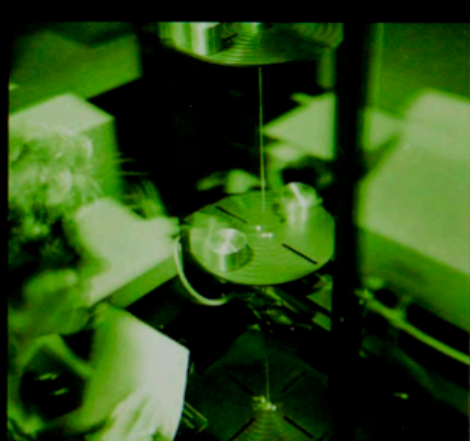
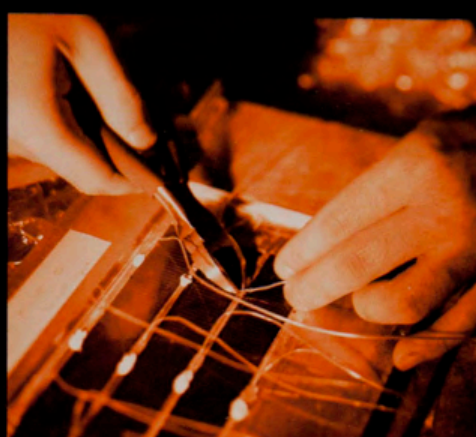
In music theory aural-skills classes, in which students listen to parts of a composition and notate what they've heard, instructors use MIDI equipment and precomposed files in exercises

*"YOU NEED TO TEACH
STUDENTS NOT ONLY HOW
TO ACCESS INFORMATION,
BUT HOW TO MAKE
JUDGMENTS ABOUT IT."*

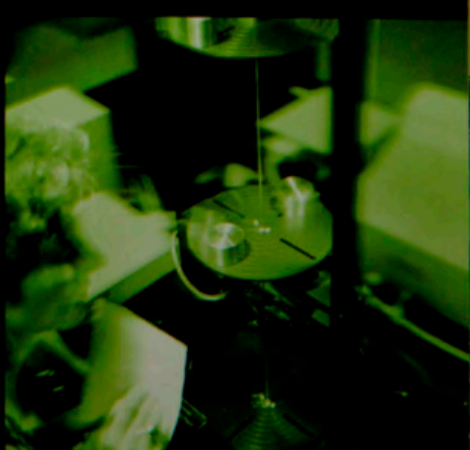
where they normally would play a part at the piano. MIDI allows the user to isolate any part of the piece and play it back identically every time. Students actually prefer MIDI playback to live piano for some tests, Sweidel says. "They're confident that it's reliable, so they can focus on listening and learning and not worry that the instructor may be having a bad day."

The best result of current technology, Sweidel says, is that it does not force creative people to work in a process-oriented fashion limited to step-by-step planning, but allows them to tap more quickly into the intuitive and playful aspects of their art. "In music, that's always been the case," he says. "You practice technique over and over again so that when you need it, you don't have to think about it. These tools enhance this creative process." ●

M E C H A N I C A L E N G I N E E R I N G



Mechanical engineering faculty and students in the School of Engineering and Applied Science conduct research to provide practical solutions to problems experienced by corporations and industry today. For more information on SMU-industry partnerships, call the Department of Mechanical Engineering at 214-768-3123.



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