Tissue mapping

A computer used to take satellite images of Earth now analyses complex medical scans of the human body

The same computer used to create vivid satellite images of Earth is now analyzing complex medical images of the human body. Michael Vannier, a radiologist at the Mallinckrodt Institute of Radiology, at an NMR computer.

Several segments of the light spectrum — hence the term multispectral. For example, when the satellite takes a picture of Chicago from more than 100 miles out, it actually takes several — green, red and infrared.

The LANDSAT computer program examines all the photos, notes the contrasts, eliminates redundancies, combines them into a composite image, and assigns realistic color to the various components.

Like a satellite, the NMR scanner can produce a multitude of pictures with different spectral characteristics.

"And that's precisely what the problem has been with NMR," Vannier explains. "Everyone is asking, 'How do we interpret this data?' At the same slice level in the human body, we receive multiple pictures that have similarities but different contrasts. In applying satellite technology, we've been able to critically examine these contrasts and exploit them to produce realistic composite images."

To make those images as real as possible, Vannier and other Mallinckrodt radiologists are collaborating with engineers from NASA's Kennedy Space Center and the University of Florida at Gainesville. The technology transfer project began one year ago.

A former NASA engineer himself, Vannier saw the obvious opportunities for cross-over applications once he realized that NMR images are really quite similar to satellite pictures. LANDSAT takes photographs in several segments of the light spectrum — hence the term multispectral. For example, when the satellite takes a picture of Chicago from more than 100 miles out, it actually takes several — green, red and infrared.

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To make those images as real as possible, Vannier and other Mallinckrodt radiologists chose colors for the composites very carefully.

"These pictures look like you just lifted a slice right out of the human body," says Vannier.

Vannier and other team members have collaborated on more than 30 patient-studies so far, producing color composites for many of them at NASA's satellite image computer in Gainesville.

"From analyzing body scans, we've also discovered that many organs and types of tissue have distinct signatures, just as landscape features do," says Vannier. Recognizing those "signatures" enables the computer to separate wheat from fields of corn and bone from muscle.

The computer breaks the NMR scan into hundreds of tiny squares and then searches the image square by square for any signature of interest to the radiologist. The capacity lets Vannier create tissue maps of the human body.

The LANDSAT computer also has artificial intelligence which permits it to learn from its successes and failures. The 100th body map it creates should be more precise than the first.

"No one can mentally assimilate NMR images the way this computer can," says Vannier.

He says the tissue maps will help radiologists and other physicians see the precise outline of a particular organ or collection of tissues, and make possible earlier diagnoses in a wide range of disorders.

Vannier provides an example: "By teaching the computer the signature for a blood clot in the brain, we can ask it to show us every part of the image in which that signature can

Continued on p. 2
Social work faculty job satisfaction surveyed

According to a national survey of social work faculty, black social work faculty members — particularly black women — perceive themselves to be less satisfied and receive less job satisfaction than their white cohort.

Black faculty members also believe they have a poorer job future than their white associates, according to the survey conducted by Larry E. Davis. WU associate professor of social work and psychology.

Davis said the purpose of the survey was to examine the qualitative job experiences of faculty in predominantly white schools of social work. That survey was an attempt "to assess how blacks and whites perceive themselves being responded to as faculty members by their students and colleagues," he added.

The clearest message the survey data conveys is that the black female faculty member, relative to other faculty members, appears to be the "underdog" in social work education, he said.

"A great deal of comparative research has dealt with the quantitative aspects of employment, such as how many minorities and women faculty are in the field and how they are faring with regards to salary and position," Davis said. "Yet, it is somewhat surprising that social work, a field so often criticized for being 'soft' and perhaps overly concerned with social and emotional issues, has not given more attention to the qualitative aspects of employment."

In conducting the survey, Davis was interested in responses to questions like, "Overall, how are you treated by students, faculty and staff?" and "How satisfied are you with your faculty position?" rather than quantitative responses to questions like, "How much do you earn?" and "What degree do you hold?"

The survey questionnaire was sent to 540 black and 550 white faculty members who worked at predominantly white institutions. The questionnaire was returned by 153 blacks (35 percent) and 114 whites (33 percent). The number of male and female respondents was almost evenly divided.

Davis focuses on responses to three survey questions in his report on the survey, titled "Black and White Social Work Faculty: Perceptions of Respect, Satisfaction and Job Permanence." He has been invited to present the paper at the Council on Social Work Education's Annual Program Meeting in Detroit, Mich. in March.

Davis said his findings suggest that the perceived quality of work experiences of social work faculty vary significantly according to race, gender and the possession of tenure.

In relation to respect from others, it appears that black faculty members perceive themselves as receiving less respect than their white colleagues. Neither gender nor tenure seems to have any significant effect on the amount of professional respect felt, Davis found.

In relation to job satisfaction, however, it appears that black faculty members are less satisfied than their white colleagues, but gender plays an important role. The survey found that black women faculty members were significantly less satisfied than their fellow black male faculty members.

The white female faculty members, on the other hand, closely resemble their white male counterparts with respect to satisfaction with their jobs. The possession of tenure improves the job satisfaction of all faculty, white and black, male and female.

In predicting future job permanence of these social work faculty, Davis said both race and gender are important indicators. "Significantly greater numbers of black faculty than white are either definitely leaving or are uncertain as to their future plans. Of those with plans to leave, it is the black female who reported having the highest proportion of any group to leave with definite plans to do so, and the lowest proportion of any group with plans to remain in their present positions."

Davis cautions that because of the small sample size of the study, the conclusions drawn must be guarded. But he feels the findings suggest that this area of research warrants further exploration.

"It is hoped that the findings of this study will serve to stimulate the enhancement of teaching environments so that these environments resemble less those elements of society we oppose, and more the society we advocate," Davis said.

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Jones — continued from p. 1 —come. What Alice Hanson has accomplished can be described only in terms of superlatives.

"[Her] work has changed and will continue to change the course of history as we understand it."

Kenneth A. Lohf, librarian for the Rare Books and Manuscripts Collection at Columbia University, wrote that the papers "will complement our already strong holdings in [colonial] economics and thereby strengthen our resources for research."

Jones is immediate past president of the Economic History Association, an international organization. She became professor emeritus at WU in July 1977.

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PHILIP A. GRIFFITHS, professor of mathematics at Harvard University, will deliver the William H. Roever Lectures in Geometry to be held Jan. 9-13. Griffiths will speak on 'Differential Systems and Isometric Embeddings' during the daily sessions which begin at 4 p.m. in Room 101 Lopata Hall.

The Roever lecture series was established one year, it is the first named lecture series in the Department of Mathematics.

The lecture series is funded by William A. and Frederick H. Roever in memory of their father, who specialized in the study of descriptive geometry. Established last year, it is the first named lecture series in the Department of Mathematics.

William H. Roever graduated from WU in 1897 with a BS in mechanical engineering. He taught astronomy here for two years before studying at Harvard University, where he earned an MA and a PhD. He returned to WU in 1908 as an assistant professor of mathematics, and in 1932 he became chairman of the Department of Mathematics and Astronomy. He retired as professor emeritus in 1974, but continued to teach until his death in 1951 at age 76.

400 students expected to attend Latin Day

The conquests and personality of Alexander the Great is the theme of the second annual Latin Day at WU, which will attract more than 400 high school Latin students and their instructors.

Latin Day I, which is sponsored by WU's Department of Classics, will be held from 9:45 a.m. to 2 p.m. on Thursday, Jan. 5, in Edison Theatre.

Kevin Herbert, chairman of the classics department, and Cyrena F. S. Clair, a Latin instructor at Parkway West Junior High School, will present illustrated lectures and a feature film on the life of Alexander the Great, starring Richard Burton.

For more information, contact Herbert at 889-5123.

LANDSAT — continued from p.

be found. Within a couple of seconds, the computer searches the entire image, coloring any area that has the hematoma signature.

In the next few months Vannier will turn his attention to converting the LANDSAT computer program so that it can operate on the computers that is part of the NMR system.

There is every indication that it should work," he says. "We can't expect everybody to run to a NASA image processing center with their NMR scans. If this technique is to be a valuable in a comprehensive manner, it will have to be converted to a form compatible with NMR computers. Then all NMR centers will have a chance to put it to the test."
Marc D. Smith, assistant professor of health care administration, presented a paper, titled “An Interventional Model of the Quality of Maintenance Therapy for End-Stage Renal Disease,” to the Council of Nephrology Social Workers at the 3rd annual meeting of the National Kidney Foundation in Washington, D.C. Smith also moderated a panel on “Research in Social Work Practice: Strategies for the Assessment of ESRD Patients and Programs” at the meetings.

Kim Strommen, associate dean of the School of Fine Arts, will exhibit his woven sculpture from Jan. 21 through Feb. 26 at the Timothy Burns Gallery, 593 N. Euclid Ave., second floor. Strommen binds strips of canvas on poles and into ropes to form free-standing sculptural forms, forcing the traditional painted canvas out from the wall and eventually to the floor. Two examples are on exhibit through Feb. 29 in the Faculty Show, Gallery at Steinberg Hall. A preview reception for Strommen’s show will be held on Friday, Jan. 22.

Sarantis Symeonoglou, associate professor of art and archaeology, lectured on “A New Perspective on the Sculptures of the Temple of Zeus at Olympia” at the 12th International Congress of Classical Archaeology Sept. 5-11 in Athens, Greece. Symeonoglou also presented a paper in late September on “The Founding of Rome” at the 12th International Congress of Classical Archaeology Sept. 5-11 in Athens, Greece. Symeonoglou also presented a paper in late September on “The Founding of Rome” at the 12th International Congress of Classical Archaeology. He spoke as a seminar, titled “City Structures, Urbanism and Literature in Greece and Rome,” organized by the Department of Classics at Princeton University.

Have you done something noteworthy? Have you Presented a paper? Won an award? Been named to a committee or elected an officer of a professional organization? The Washington University Record will help spread the good news. Contributions regarding faculty and staff scholarly or professional activities are gladly accepted and encouraged. Send a brief note with your name, position, department and activity to Notables, Campus Box 1142. Please include a phone number where you can be reached.

Local executives on loan through consortium

Olin Library display explores Martin Luther’s impact on the arts

In celebration of the anniversary of Martin Luther’s 500th birthday, an exhibit has been assembled in the main display area on the third level of Olin Library.

The exhibit, titled “Martin Luther and the Arts,” focuses on the aesthetic and intellectual impact the German reformer created in the cultural world.

“We wanted to make the exhibit neither religious nor historical,” said Kenneth L. Nabors, humanities librarian at Olin. “We took an interdisciplinary approach that we hope will have appeal for a greater number of people.”

Nabors coordinated the exhibit with the help and resources of the University’s music and art libraries. The display, on view through mid-January, includes items such as a 1726 edition of the Luther Bible with decorative slipcase; a reprint of the first Luther hymnal (1524), titled Achdliederbuch (Eight Songs Book); a recording of Mendelssohn’s “Reformation” symphony; and assorted volumes which portray Luther in poetry, music and drama.

A central exhibit of the conference is Luther’s impact on the arts. It is topic of “lectures series”.

Orwell’s ‘1984’ is topic of lecture series

1984, the book by George Orwell which introduced such terms as “Big Brother” and “newspeak,” will be explored in a series of free Saturday seminars beginning Jan. 21 at WU.

The Saturday Seminars, a series of lectures by WU College of Arts and Sciences faculty, are sponsored by the Master of Liberal Arts Program and University College. They will be held from 11 a.m. to 12:30 p.m. on specified Saturdays in the Ann Whitney Olin Women’s Building Lounge on campus.

The seminar topics are: Jan. 21 — “Orwell and the Arts” focusing on the musical foundation of the church service and the musical foundation of the church service as well. “Music is the best gift of God,” he wrote. “Oftentimes it inspired and stirred me so that I again found pleasure in preaching.”

In his attempt to return to the roots of Christianity, Luther initiated a flowering of the arts, a slice of which is represented in Olin Library. The exhibit can be viewed during regular library hours. For more information, call the reference desk at 889-5410.

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CALENDAR
Dec. 15-Jan. 21

Saturday, Dec. 17
10 a.m.-4 p.m. School of Fine Arts Ceramics Sale, Bixby Gallery.

Sunday, Dec. 18
6 p.m. Interdenominational Vesper Service with Paul McAuley, dir., WU Protestant Center. Graham Chapel.

Saturday, Dec. 14
9 a.m. Personal Computing Education Center Short Course, "Using Interactive Computing with MUSIC — Faculty and Student Orientation." Free to WU community. (Also Sat., Jan. 21, noon to 3 p.m.) For registration and class location, call 889-5530.

Tuesday, Jan. 10
2:30 p.m. Center for the Study of Data Processing Symposium Series, "Perspectives on the User Interface." Ken Villard, Villard Renewers. 30 January Hall.

Thursday, Jan. 19

Friday, Jan. 20
"30 p.m. Inter-Varsity Christian Fellowship Meeting, Green Suffs Line. Wohr Center.

LECTURES
Thursday, Dec. 15


Friday, Dec. 16


2 p.m. McDonnell Lab. for Psychical Research Seminar, "Coincidence and Explanation." Galen Fletcher, Philosophy Dept., SU-Edwardsville, Ill. 117 Ends.

Monday, Dec. 19

Tuesday, Dec. 20

Thursday, Jan. 5
9:30 a.m. Latin Day for area high school students. Speakers include: Kevin Herbert, chairman, WU classics dept.; and Cyprus F. M. Clair, Patton. West Junior High School. Edison Theatre.

Friday, Jan. 6
6 and 8:30 p.m. WU Association Travel Lecture Series, "China." Rapheal Green, filmmaker. Graham Chapel. For ticket info, call 889-5122.

Monday, Jan. 9
4 p.m. Department of Mathematics William H. Roever Lectures in Geometry, "Different Systems and Isometric Imbeddings." Philip A. Griffiths, prof. of mathematics, Harvard. 101 Lopata. (Also Jan. 10, 11, 12 and 13, same time, Lopata.)

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EXHIBITIONS
"American Indian Art." Through Jan. 8. Gallery of Art. 10 a.m.-5 p.m. weekdays, 1-5 p.m. weekends.

"Cabinets and Surrealism." Through Jan. 8. Gallery of Art, lower west gallery. 10 a.m.-5 p.m. weekdays; 1-5 p.m. weekends.

"Martin Luther and the Arts." Through Jan. 11. Olm Library, third level. Open regular library hours.

"Faculty Show." Through Jan. 29. Gallery of Art. 4th. upper gallery. 10 a.m.-5 p.m. weekdays, 1-5 p.m. weekends.

"The Tradition of Excellence: Contemporary Fine Printing From Private Presses." Through Dec. 30. Special Collections, Olm Library. 5th level. Open weekdays 8:30 a.m.-5 p.m.

"Life and Land in 19th-Century Europe." Through April 22. Gallery of Art. lower gallery. 10 a.m.-5 p.m. weekdays, 1-5 p.m. weekends.

"The Sculpture Baronesse Yrsa Von Leistner." Jan. 16 to Feb. 5. Bixby Gallery. 10 a.m.-4 p.m. weekdays, 1-5 p.m. weekends.

FILMS
Friday, Dec. 16
7 and 9:30 p.m. WU Filmboard Series, "The Paper Chase." $2. Brown Hall Aud. (Also Dec. 17, same times.)

Friday, Jan. 20
7 p.m. WU Filmboard Series, "Gone With The Wind." $2. Brown Hall Aud. (Also Sat., Jan. 21, and Sun., same day, same time, Brown.)

SPORTS
Thursday, Jan. 19
10:30 p.m. Hockey, WU Hockey Club vs. St. Louis U. Affton Rink.

Saturday, Jan. 21
5:30 p.m. Women's Basketball, WU vs. Rochester University. Francis Gym.
7:30 p.m. Men's Basketball, WU vs. UMSL. Francis Gym.

Calendar Deadline
The deadline to submit items for the Jan.-Feb. school calendar is Dec. 15. Items must be typed and state name, date, place, nature of event, sponsor and admission cost. Incomplete items will not be printed. If available, include speaker's name and identification and the title of the event; also include your name and telephone number. Address items to King McElroy, calendar advisor, Box 1142.

A spear-bearing warrior from the terra-cotta army of Emperor Ch'in Shih Huang Ti, buried almost 22 centuries ago, in Qin, China, is one of many curiosities to be shown in Raphael Green's traveling exhibition, titled "China." The film will be shown in Graham Chapel at 6 and 8:30 p.m. on Jan. 6 and is sponsored by the WU Association.

Freshmen win Air Force ROTC scholarships
Eleven WU freshmen recently won Air Force ROTC scholarships with each one valued at about $40,000.

Students of the year for South-40 dorms
Several hundred pieces of pottery, glass and other art objects will be on sale from 9 a.m. to 4 p.m. Saturday, Dec. 17, in Bixby Hall's gallery. The pieces were made and will be sold by students in the School of Fine Arts.

Student pottery to be sold in Bixby Gallery
Applications for the 1984-85 student director staff are now available at the Residential Life Center, the Cage in Wohr Center, and the Resource Desk in Mallinckrodt Center. Students who enjoy working with people and have a sense of commitment, as well as warmth and leadership potential, are encouraged to apply.

Completed applications and all supporting materials are due by Jan. 20, 1984, in the Residential Life Center.

Sponsorships needed for South-40 dorms
Applications for the 1984-85 resident advisor staff are now available at the Residential Life Center, the Cage in Wohr Center, and the Resource Desk in Mallinckrodt Center. Individuals who enjoy working with people and have a sense of commitment, as well as warmth and leadership potential, are encouraged to apply.

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