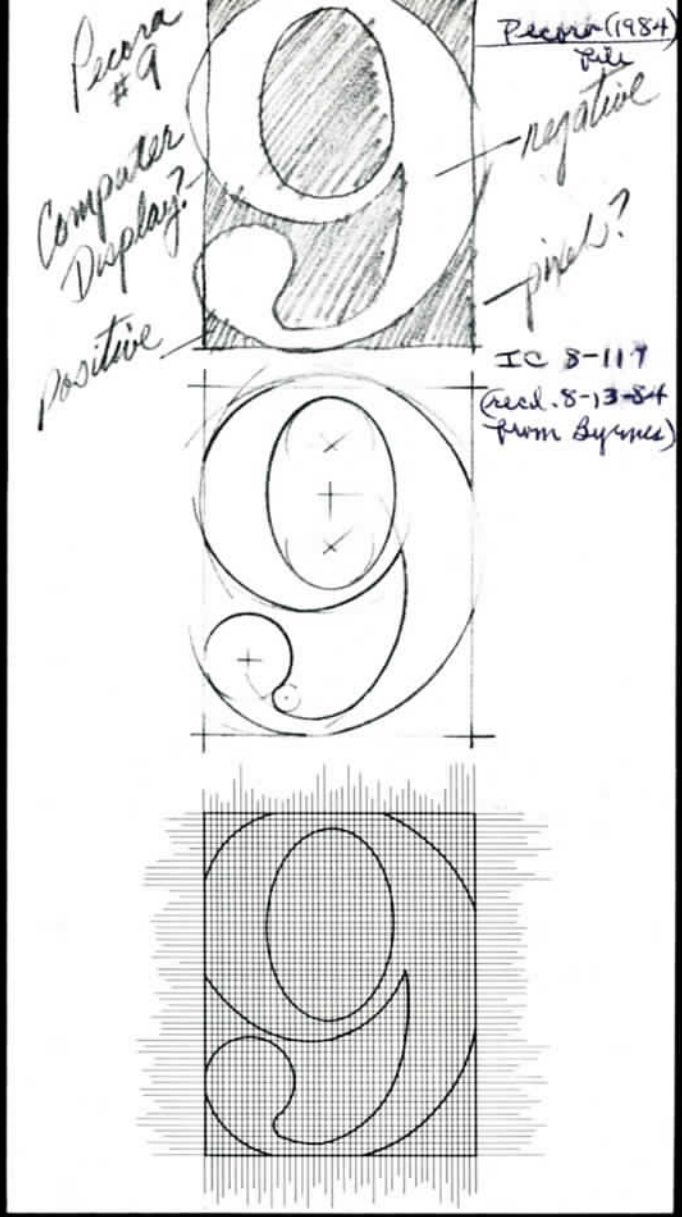
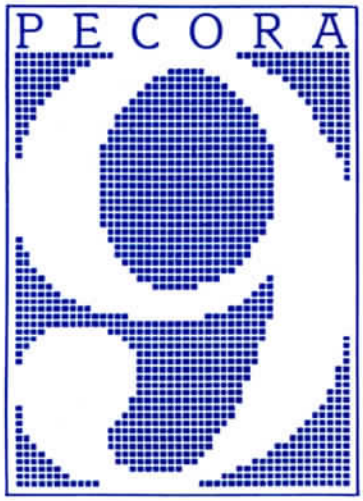


PECORA

PRELIMINARY PROGRAM

PRELIMINARY PROGRAM



SPATIAL INFORMATION TECHNOLOGIES FOR REMOTE SENSING TODAY AND TOMORROW

October 2, 3, and 4, 1984

Sioux Falls, South Dakota
Howard Johnson Convention Center

PECORA IX

The Ninth William T. Pecora Memorial Remote Sensing Symposium

Sponsored By:
IEEE Computer Society

In Cooperation with:
National Aeronautics and Space Administration
United States Geological Survey
American Society of Photogrammetry

The Pecora Symposium was established in 1975 to foster the exchange of scientific and resource management findings resulting from the use of remotely sensed data. The symposium series honors the memory of William T. Pecora, former Director of the U.S. Geological Survey and Undersecretary, Department of the Interior. Dr. Pecora played a major role in the development and establishment of this country's satellite remote sensing systems.

This Pecora Symposium will focus on the wide variety of spatial information technologies germane to the remote sensing community. The purpose of this meeting is to expose the participants to all aspects of computer spatial data handling, an area which now involves a variety of diciplines. Topics will include:

- Hardware
- Geographic Information Systems
- Spatial Data Structures
- Graphics
- Natural Language
- Advanced Techniques
- NASA Information Systems
- Processing Remotely Sensed Data
- Artificial Intelligence
- Spatial Navigation
- Classification
- Processing Elevation Data

Critical technological and scientific requirements will dictate how the remote sensing community will perform today and tomorrow. Therefore, this symposium's goal is to bring together managers, technologists, and scientists from leading private, government, and university sectors to display and present the latest research developments.

PECORA IX COMMITTEE:

Conference Chairman
William L. Alford
Defense Mapping Agency HTC
Mail Code STA
Washington, DC 20315
202-227-3133

Program Chairman
Dr. Robert M. Haralick
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Virginia Tech
Blackburg, VA 24016
703-961-6819

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Code 931
NASA/GSFC
Greenbelt, MD 20771
301-344-9541

Logistics Chairman
Raymond A. Byrnes
U.S. Geological Survey
EROS Data Center
Sioux Falls, SD 57198
605-594-2283

Tuesday, October 2

7:30-8:30 REGISTRATION

8:30 OPENING REMARKS

9:00 a.m.

HARDWARE

Ultra Computers J. Paul Roth, IBM Thomas J. Watson Research Center

Advanced Communications Technologies for Image Processing William Likens and Harry Jones, NASA/Ames Research Center

9:50 BREAK

10:40 a.m.

A Parallel Processor for Analysis of Multispectral Data S. Chandrasekhar, Energy, Mines and Resources, Canada

A Hardware-Oriented Pattern Classifier for Remote Sensing Ikram E. Abdou, University of Delaware

11:30-1:00 OPENING LUNCHEON WITH KEYNOTE SPEAKER

1:00 p.m.

GIS IMPLEMENTATION

Geographic Information Systems Duane Marble, State University of New York at Buffalo

1:40 p.m. (Concurrent Session)

Development of a Data Base Management System for Natural Resource Inventory Chris Johannsen, Terry Barney, Gregory Koeln, University of Missouri and Jove Pan, Bell Labs

Design and Development of a Geographic Information System for Illinois Colin G. Treworgy, Illinois Natural History Survey

Design of Computer Software for Geographic Image Processing Paul Ritter, Agnis Kaugars and Tony Travlos, University of California, Berkeley

Microcomputer-Based, Statewide, Digital Land-Surface Information David Lusch and William Enslin, Michigan State University

PROCESSING REMOTELY SENSED DATA (Concurrent 1:40 Session)

MIN/MAX Autocorrelation Factors for Multivariate Spatial Imagery Paul Switzer, Stanford University, A.A. Green, C.S.I.R.O. Australia

The Spatial Structure of Terrain: A Process Signal in Satellite Digital Images Richard G. Craig, Kent State University

Application of the Theory of Regionalized Variables to the Spatial Analysis of LANDSAT Data James R. Carr, University of Missouri, Donald E. Myers, University of Arizona

Spatial Variation Analyses of Thematic Mapper Data for the Identification of Linear Features in Agricultural Landscapes R.E. Pelletier, NASA/Earth Resources Laboratory

The Role of Spatial Resolution and Spectral Content in Change Detection V.A. Milazzo, U.S. Geological Survey

GIS for Soils and Rangeland Management R.G. Best and F.C. Westin, South Dakota State University

The Evolution of Map, Overlay, and Statistical System (MOSS) on a VAX 32-bit System Configuration R.J. Thompson and Lyndon Oleson, U.S. Geological Survey

3:00 BREAK

3:20 p.m.

SPATIAL DATA STRUCTURES

Images as Maps/Maps from Images David McKeown Jr. Carnegie Mellon University

A General Spatial Data Structure Linda Shapiro and Bob Haralick, Virginia Polytechnic Institute and State University

Topological Grid Structure: A Data Structure for Earth Science Modeling Michael Goldberg, Goddard Space Flight Center, Wayne A. Hallada and Richard F. Marcell, Science Applications Research, Wendy Lindboe, Computer Science Corporation

A Hierarchical Method for Representation Terrain Relief Renato Barrera, Ana Maria Vazquez, Instituto de Investigaciones en Matematicas Aplicadas y en Sistemas

Wednesday, October 3

8:00 a.m. (Concurrent Session)

NATURAL LANGUAGE

Natural Language Question and Answering Systems Bonnie Webber, University of Pennsylvania

Using a Menu-Based Natural Language Interface to Ask Spatial Database Queries Craig W. Thompson, Texas Instruments Incorporated

Natural Language Interfaces to Visual Sensing Systems Christopher Malley and Mallory Selfridge, University of Connecticut

Understanding Natural Language Commands Hubert Chin, Grumman Aerospace Corporation

NASA PROGRAMS IN REMOTE SENSING INFORMATION SYSTEMS (Concurrent 8:00 Session)

Hyper-Spectral Image Processing Jerry Solomon, NASA/Jet Propulsion Laboratory

Global Resources Information System Jose Urena and Fred Billingsley, NASA/Jet Propulsion Laboratory

Pilot Climate Data System Paul Smith, NASA/Goddard Space Flight Center

Pilot Land Data System Phil Cressy, NASA/Goddard Space Flight Center

Pilot Ocean Data System Catalog John Johnson, NASA/Jet Propulsion Laboratory

9:50 BREAK

10:10 a.m.

GIS APPLICATIONS

Applications of Geographic Information Systems for Analysis of Radio-Telemetry Data on Wildlife Gregory T. Koeln, University of Missouri, Elizabeth Cook, Missouri Department of Conservation

An Automated Approach to Estimating Time-Specific Population Densities for Metropolitan Areas Jeffrey M. Young, Lockheed Engineering and Management Services, Co., Inc., Frank Gossette, University of Delaware

Forest Fire Advanced System Technology Ronald G. McLeod, James R. Huning, Jet Propulsion Laboratory, John R. Warren, U.S.Department of Agriculture, Forest Service

Spatial Analysis Requirements of the Federal Mineral Lands Information System J.A. Sturdevant, Technicolor Government Services, Inc., R.L. Kleckner, U.S. Geological Survey

The Application of a Geographic Information System to Management of the Penn State University Experimental Forest Wayne L. Myers and John Kolemik, Pennsylvania State University

11:50-1:00 LUNCH

1:00 p.m.

ADVANCED TECHNIQUES

Advanced Computer Interpretation Techniques for Earth Data Information Systems Philip H. Swain, Purdue University

Classification Using Context Robert M. Haralick and Ming Chuan Zhang, Virginia Polytechnic Institute and State University

ASP: An Algorithm and Sensor Performance Evaluation System Tom Henderson, The University of Utah

Segmentation of Computer-Classified LANDSAT Multispectral Scanner Data into Spatially-Connected Regions of Elk Habitat Components R. Jay Murray, Oregon State University

Algorithmic Development of Spatial Operators R.W. Claire, U.S. Geological Survey

Processing of Scanned Imagery for Cartographic Feature Extraction S.P. Benjamin and L. Gaydos, U.S. Geological Survey

3:30 BREAK

3:50 p.m.

ARTIFICAL INTELLIGENCE

Future Expert Systems in Regional Resource Evaluation—Lessons from PROSPECTOR Richard B. McCammon, U.S. Department of the Interior

Interactive Aids for the Development of Computer Vision Rule Bases Brian T. Mitchell and John F. Lemmer, PAR Technology Corporation

An Application of Expert Systems Technology to Remotely Sensed Image Analysis W.K. Erickson, and W.C. Likens, NASA/Ames Research Center

Applications of Artificial Intelligence for the Earth Science Community William J. Campbell and Larry H. Roelofs, Goddard Space Flight Center

Thursday, October 4

8:00 a.m. (Concurrent Session)

GIS CONCEPTS

Terrain Elevation and Surface Feature Data Display Marshall B. Faintich, Defense Mapping Agency

Spatial Knowledge Representation in a Geographic Querying System Micha I. Pazner and Terence R. Smith, University of California, Santa Barbara

An Attribute-Driven Statistics Generator for a GIS Environment Randy Thomas, Paul Ritter, and Agnis Kaugars, University of California, Berkeley

Accuracy in Geographic Information Systems: An Assessment of Inherent and Operational Errors John D. Vitek, Stephen J. Walsh, and Mark S. Gregory, Oklahoma State University

The Map Library — A Large Scale Data Structure for Geographic Information Systems Peter Aronson, Environmental Systems Research Institute

The Application of Spatial Information Technology to Petroleum Resource Assessment Analysis Betty M. Miller, U.S. Geological Survey

GRAPHICS (Concurrent 8:00 Session)

Parallel Coordinates for Multi-Dimensional Displays Alfred Inselberg, IBM Scientific Center, and University of California

A Device Independent Interface for Image Display Software M.R. Szczur, D.C. Perkins, J. Owings and S. Contractor, Goddard Flight Center

A Table-top, Microcomputer Approach to the Management, Analysis and Display of Geographic and Image Data Using a Map-oriented, Geo-referenced Framework L.D. Miller, T. Cheng, M. Unverferth, Y.K. Yang, M.G. Kim, B. Elliot, Nebraska Remote Sensing Center

Digital Image Display and Analysis of Polar Orbiting Meteorological Satellite AVHRR Data T. Hotrabhavananda, W. McFarland, L. Johnson, M. Lyon, and T. Barney, University of Missouri

Image Processing for Data Integration in Mineral Exploration Stan Aronoff, DIPIX Systems Limited

10:20 BREAK

10:40 a.m.

SPATIAL NAVIGATION

Convex Hulls, Voronoi Diagrams, and Terrain Navigation Joseph O'Rourke, Johns Hopkins University

Two Dimensional Mobile Robot Positioning Using Onboard Sonar David Miller, Yale University

Automated Map Transformation for Unmanned Planning and Navigation A. Meystel, University of Florida

12:00 LUNCH

1:00 p.m.

CLASSIFICATION

Using Spatial Logic in Classification in LANDSAT TM and MSS Data James. W. Merchant, University of Kansas

Analysis of a Classification Error Matrix Using Categorical Data Techniques George H. Rosenfield and Katherine Fitzpatrick-Lins, U.S. Geological Survey

A Comparison of LANDSAT Point and Rectangular Field Training Sets for Land-Use Classification Craig H. Tom, Hughes Aircraft Company, Lee D. Miller, Nebraska Remote Sensing Center

An Evaluation of the Accuracies of Five Algorithms for Machine Classification of Remotely Sensed Data Michael H. Story, James B. Campbell and Glenn Best, Virginia Polytechnic Institute and State University

Monitoring Federal Minerals with the Use of LANDSAT Albedo Difference and Ancillary Data. Raymond E. Arndt, U.S. Department of the Interior, Bureau of Land Management.

2:50 BREAK

3:10 p.m.

ELEVATION

Automated Drainage Line Delineation from Raster Elevation Data Susan K. Jenson, Technicolor Government Services, Inc.

An Interactive Technique to Generate Digital Elevation Data Using a Vidicon Camera Jayanta K. Sircar and Robert M. Ragan, University of Maryland

Generation of Digital Elevation Models on a Microcomputer John S. Nelson and Stephen W. Miller, Louisiana State University

REGISTRATION:

Registration may be made on the attached form. Advanced registration is $120 for IEEE members, $140 for non-members. On-site fees are $140 for members and $160 for non-members. Registration for spouses is $40 (includes luncheon, socializer. and banquet) and for students is $25 (includes one copy of proceedings; no social functions).

Mail advanced registration by September 24 to:

Pecora IX
P.O. Box 84827
Sioux Falls, SD 57118

Make checks payable to: Pecora IX Symposium. For registration information, call (605) 594-2283, (FTS) 784-7283. Charge cards cannot be accepted.

HOTEL ACCOMMODATIONS:

The Pecora IX Symposium will be held at the Howard Johnson Convention Center in Sioux Falls, South Dakota. A block of rooms is being held for Pecora registrants until Sept. 21 at the following special rates (plus tax):

Single Occupancy	$28.50
Double Occupancy	$36.50
Each person over 18	$ 6.00

Reservations are to be made by participants directly with the hotel. The address of the symposium hotel is:

Reservation Desk
Howard Johnson's Motor Lodge
3300 West Russell P.O. Box 1214
Sioux Falls, SD 57101
Phone: (605) 336-9000
Toll-free nationwide reservations: 1-800-654-2000

The Brimark Inn and the Ramada Inn are adjacent to Howard Johnson's. Other major motel chains, such as Holiday Inn and Best Western, have facilities within a few miles.

AIRLINES:

Sioux Falls has airline service from United, Republic, Western, Frontier, Ozark, and smaller regional carriers.

PROCEEDINGS:

A bound volume of the Pecora IX Proceedings will be available to each registrant at the symposium. Additional copies will be available for $20.00.

EXHIBITS:

Commercial exhibit space is available at $700 per booth until August 6 and $800 after that date. Contact the exhibits chairman for information:

William J. Campbell
Code 931
NASA/GSFC
Greenbelt, MD 20771
301-344-9541

SPOUSE ACTIVITIES:

Spouse registration includes the opening luncheon and keynote address, a cocktail-and-hors d' oeuvres reception, and the Pecora Awards Banquet. Sioux Falls is a regional retailing center with excellent shopping malls and many specialty shops. The weather in early October normally consists of warm, sunny days and cool, clear evenings. A favorite local feature is the city's greenway with a paved bike/running trail that winds through Sioux Falls, often along the Big Sioux River. There are several outstanding restaurants within a few miles of the symposium site in this city of 90,000. Elmwood Public Golf Course, the Great Plains Zoo, and the Siouxland Heritage Museums (Old Courthouse and Pettigrew) are local attractions.

TOURS TO THE EROS DATA CENTER:

Tours to the U.S. Geological Survey's EROS Data Center will be available during the symposium. No fee will be required.

REGISTRATION
PECORA IX SYMPOSIUM
SPATIAL INFORMATION TECHNOLOGIES FOR REMOTE SENSING TODAY AND TOMORROW
OCTOBER 2-4, 1984

Name _____ **Title** _____

Organization _____ **Phone** _____

Address _____ **Zip** _____

ADVANCED (by Sept. 24)		**ON-SITE**	
IEEE Members	$120	IEEE Members	$140
Non-Members	$140	Non-Members	$160
Students (Includes Proceedings only)			$25
Spouse (Includes Luncheon, Socializer, and Banquet)			$40

IEEE Membership Number _____

Make checks payable to:
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Pecora IX, P.O. Box 84827, Sioux Falls, SD 57118
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