

## Chairman's Corner

**Shirley Brandt**  
Chairman

THE HOUSTON SECTION OF AIAA is categorized by National Headquarters as a large section. This category includes sections which have between 400 and 900 members. Our section is on the high side of this category. However, only about 15% of the membership is active in the local activities. The local section can use the help of all members in whatever amount of time and energy each person is able to devote. Getting involved can be gratifying.

Although the 1993-1994 AIAA year has only 25% of the year remaining, there is still plenty of time to get involved. Besides the monthly dinner meetings and Lunch & Learn meetings, another Employment Workshop is being organized. In addition, arrangements are in progress for the Annual Technical Symposium to be held in May. All of these programs could use your help. There are many more activities that we could offer with more participation from our membership.

Consider becoming an Active Member of AIAA, and share your ideas and effort for the benefit of the entire membership. As you gain momentum from involvement in the last quarter of the year, maintain this momentum, and stay active during the next administrative year. **H**

### *When I was a kid...*

movies only cost a dime, but not anymore. Now days you have to take every break you can get...That's why AIAA gives you the opportunity to easily earn coupons worth five dollars off:



**Take Five**

**dues ♦ meeting registration ♦ personal line items  
♦ books ♦ TID Services ♦ continuing education**

Just sponsor a new member by putting your name in the sponsor block of any AIAA membership application. Then give the application to the person you feel would benefit from membership. For every person you sponsor that becomes a member of AIAA, you receive a \$5 coupon. The more people you sponsor, the more coupons you receive. Maybe you can't go to the movies on them, *but you could accumulate enough coupons to get a free membership renewal.*

**For more information call 202/646-7430.**



American Institute of Aeronautics and Astronautics

## *In This Issue...*

Chairman's Corner .....	1
Section Elections .....	2
Committee News .....	3
Been There, Done That...25 Years Ago .....	4
Events .....	4
AIAA Calendar .....	5

**Horizons** is the monthly newsletter of the Houston Section of the American Institute of Aeronautics and Astronautics. It is created by members of the Houston Section and reproduced at the Houston offices of Lockheed Engineering and Sciences Company. Please address all correspondence to the Vice-Chairman of Operations, Tek Shrini, U08C, or to the Editor, Lou Livingston, 1911 Pepper Hill, Houston, TX 77058.

## Section Elections

**Dr. George Nield**  
**Chairman-Elect**

IN ACCORDANCE WITH SECTION BYLAWS, a nominating committee has been formed to come up with nominees for next year's officers and council members. Nominating committee members include George Nield, committee chairman, Steve Hawley, André Sylvester, Suzan Voss and Paul Judas. If you would like to nominate someone or be considered for one of the positions yourself, please contact one of the committee members prior to March 15. For the Section to be successful next year, we will need to have good people serving in the leadership positions. To help in understanding the responsibilities associated with each position, excerpts from the Bylaws are reprinted below:

**Chairman:** The Chairman shall be the Chief Executive Officer of the Section. He shall be a member of the Council and of all committees except the Nominating Committee. The Chairman shall preside at all meetings and functions of the Council and of the Section and represent the Section in dealing with outside agencies, making all appointments except the Nominating Committee and transacting all business of the Section as directed by it or by its Council, and in accordance with these Bylaws.

**Chairman-Elect:** The Chairman-Elect shall assist the Chairman in performing his duties as requested by the Chairman. He shall attend Executive Council committee meetings to monitor and become familiar with the functions of the Section officers and the Section committees. He shall coordinate with all officers, councillors, and committee chairmen to prepare plans for the orderly transition for his term of office during the following year.

**Vice Chairman:** The Vice Chairman-Operations and the Vice Chairman-Technical shall be members of the Council and responsible for conducting the detailed planning in their respective areas. [The VC-

Ops oversees the activities of a number of committees, including Programs, Membership, and Publicity. The VC-Technical oversees the technical activities of the Section, including especially the planning for the annual Technical Symposium.]

**Secretary:** The Secretary shall be a member of the Council and shall maintain minutes of all meetings of the Section and shall be custodian of all its records not specially assigned to others. The Secretary shall conduct the correspondence of the Section and the Council, send out all meetings notices and shall maintain an accurate membership list, with addresses.

**Treasurer:** The Treasurer shall be a member of the Council, and shall have charge of the funds of the Section, shall make all required financial reports and and such expenditures as may be authorized by the Section or by the Council or by the Bylaws of the Institute.

**Council Member:** The Council shall consist of not less than four elected Members [we currently have 11, with five positions coming open this year], and the Chairman, Chairman-Elect, Vice Chairman-Operations, Vice Chairman-Technical, Secretary, Treasurer, and the Chairman of the previous year. The Council shall have general supervision of the work of the Section. The elected Council Members shall take office at the beginning of the administrative year [June 1] for terms of two years and shall continue in office until their successors qualify and take office. Council Members shall be limited to two consecutive two-year terms. One council position in alternate years shall be set aside for a member who is under the age of thirty-one at the time of election. 14

ABSTRACTS FOR PAPERS to be presented at the Houston Section's 19th Annual Technical Symposium are due March 25, 1994. See flyer in this issue for details. Submit abstracts or direct inquiries to Dudley Nelson, LESC/B25, 333-7054.

## *Committee News*

### Fluid Dynamics TC

**Rakesh Bhargava**  
**Chairman, Fluid Dynamics TC**

THE FLUID DYNAMICS TC HAS SCHEDULED two interesting seminars for March and April:

- March: "Parallel Processing in Computational Mechanics," by Dr. Rajesh Aggarwal, ATERC, Inc.
- April: "Survey of General Purpose Commercial CFD Programs" by Dr. Christopher J. Matice, Stress Engineering Services, Inc.

Date and location for these seminars will be announced as soon as possible. For further information contact Dr. Rakesh Bhargava at 713/983-0057. **H**

### Spirit of Apollo Scholarship Program

**Dr. George Nield**  
**Chairman-Elect**

FOR SEVERAL YEARS NOW, THE HOUSTON SECTION of the AIAA has sponsored the Spirit of Apollo scholarship program that currently provides a \$1,000 scholarship each year. Applicants must have defined a scholastic plan that provides entry into some field of engineering or science pertinent to AIAA technical activities and must meet other specified eligibility requirements.

The scholarship was established in 1988 and is funded from interest on monies the Section maintains in a local savings account.

We initiate the process each year with a mail-out package to college and university financial offices in mid-February. Included in the package is a description of the application process, selection criteria, and application forms. This year's applications must be postmarked by May 2. A scholarship committee,

headed by the Chairman-Elect, is appointed to evaluate the applications and select the recipient for the following school year. Successful applicants are notified in mid-May. The first half of the scholarship amount is mailed to the school's financial office at the start of the fall term, with the second half provided at the start of the spring term.

A copy of this year's application package is included in this issue of Horizons. For more information on the scholarship program, please contact me at 483-1364. **H**

### Second Unemployment Workshop Planned

**Dr. Zafar Taqvi**  
**Coordinator**

TENTATIVE PLANS FOR THE SECOND AIAA Unemployment Workshop have been made. The following tentative dates have been reserved at the Gilruth Center:

• Counselor training	TBD
• Registration	March 28
• Session 1	April 4
• Session 2	April 6
• Session 3	April 11
• Session 4	April 18

Sessions will run from 5:30 to 8:30 PM. **H**



Attendees at the January dinner meeting hear about the National Aerospace Plane.

Photo by Jim McLane

## *Been There, Done That ... 25 Years Ago*

David S. F. Portree  
History/Heritage Committee

AS SPRING ARRIVED IN HOUSTON, APOLLO 9 left Florida for the first orbital test of the Lunar Module (LM) with a Command/Service Module (CSM). The *Space News Roundup* reported events this way...

### **Successful Apollo IX Forges Missing Link in All-Up Stack**

"Apollo IX was launched into a near circular 102.3 x 103.9 nm orbit following an on-time liftoff at 10 a.m. CST on March 3 from Kennedy Space Center Launch Complex 39A. At three hours after liftoff, Apollo IX crewmen James McDivitt, David Scott, and Russell Schweikart...did a turnaround and docked with the LM nested in its housing atop the S-IVB...The LM extraction went normally, and for the first time the entire Apollo spacecraft was flying in space.

"[On March 7] *Spider* (LM) spun an invisible web around *Gumdrop* (CSM)...As *Spider* closed on *Gumdrop*...Scott, flying solo in the Command Module, sang out as he spotted the LM emerge into daylight, 'You're the biggest, friendliest, funniest-looking spider I've ever seen!'" (Excerpted, *Space News Roundup*, March 21, 1969.)

### **Apollo X Launch Set for May 18**

"The Apollo X mission remains...a descent to within 50,000 feet of the moon's surface...a final decision...will be made next week after a review of Apollo IX data." (Excerpted, *Space News Roundup*, March 21, 1969.)

### **Rock Picking Lunartics**

"Practicing with tong and scoop...[Apollo XI Commander Neil Armstrong and LM Pilot Buzz Aldrin] trained last week on the gravel-covered west flank of the Quitman Mountains, Hudspeth Co., Texas.

Through practice, Armstrong found that he could steady himself by leaning on the lunar scoop, important because of the restriction placed on the ability to bend by the bulky suits to be worn during the EVA." (Excerpted, *Space News Roundup*, March 7, 1969.)

### **LM-2 Drops Simulate Landing Accelerations**

"An Apollo lunar module today will make a landing—not on the moon but on a prepared surface in the MSC Vibration and Acoustic Test Facility. The landing is the first in a series of five drop tests from heights ranging from eight to 24 inches on man-made slopes and obstructions to simulate landings on rough moonscapes." (Excerpted, *Space News Roundup*, March 21, 1969.)

## *Events*

### **AIAA/SOLE National Symposium**

Steve Zobal

THE AIAA HOUSTON SECTION AND THE SOCIETY OF LOGISTICS ENGINEERS (SOLE) will jointly sponsor the Sixth Space Logistics Symposium here at JSC, November 7-10, 1994. The Symposium, with the theme "Integrating Space Logistics in the Future—Working Smarter with Fewer Resources," provides an opportunity to focus upon and address relevant space logistics issues and solutions in today's socioeconomic environment. The Call for Papers appeared in the January 1994 issue of *Aerospace America*. You still have time to submit a paper; the abstract deadline has been moved back to April 15, 1994. And, if you don't want to submit a paper, we can use your support on one of the symposium committees. If you can help, contact Shirley Brandt at 929-7289 or Steve Zobal at 283-1023.

## Apollo Anniversary

Dr. George Nield  
Chairman-Elect

THE TWENTY-FIFTH ANNIVERSARY OF THE APOLLO XI moon landing is only a few months away. If you have any ideas for activities that you would like to see the AIAA sponsor to commemorate that event, either on our own or in conjunction with other organizations, please contact George Nield at 483-1364. **H**

## AIAA Calendar

THE AIAA CALENDAR is intended to encompass all Houston Section events and significant dates. This includes Executive Council meetings, which are open to interested members, and *Horizons* deadlines.

### March

#### 21-24 - Monday-Thursday

AIAA/NASA Conference on Intelligent Robots in Field, Factory, Service and Space (CIRFFSS). South Shore Harbour Resort and Conference Center.

Information: Mary Stewart, 483-1724 (fax 483-7580).

#### 24 - Thursday

Monthly Executive Board meeting.  
5:15-6:30 PM.

#### 28 - Monday

*Horizons* inputs for April due COB.

#### 31 - Thursday

Monthly dinner meeting.  
"Design Challenges of Several Unconventional Aircraft," John Roncz, AIAA Distinguished Speaker.  
JSC Gilruth Center, 5:30/6:30/7:30.

### April

#### 21 - Thursday

Monthly Executive Board meeting.  
5:15-6:30 PM.

#### 25 - Monday

*Horizons* inputs for May due COB.

#### 28 - Thursday

Monthly dinner meeting.

"Information Superhighway: Southwestern Bell's Role," Wayne Alexander, Regional Vice-President, SW Bell Telephone.  
JSC Gilruth Center, 5:30/6:30/7:30.

### May

#### 19 - Thursday

19th Annual Technical Symposium: "Uniting the World Through Aerospace".  
Bayou Bldg., UHCL

Monthly Executive Board meeting.  
5:15-6:30 PM.

#### 31 - Tuesday

*Horizons* inputs for June due COB.

### June

#### 23 - Thursday

Monthly Executive Board meeting.  
5:15-6:30 PM.

#### 30 - Thursday

Monthly dinner meeting.  
Annual Honors & Awards Banquet.  
JSC Gilruth Center, 5:30/6:30/7:30. **H**



# HORIZONS

## OUTSTANDING SECTION AWARD



1975-1976  
1976-1977  
1979-1980  
1980-1981  
1981-1982  
1983-1984  
1986-1987  
1988-1989

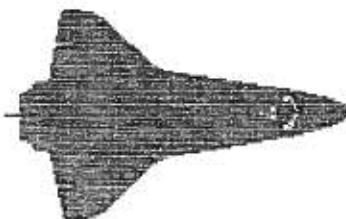


## SECTION SPECIAL EVENT AWARD

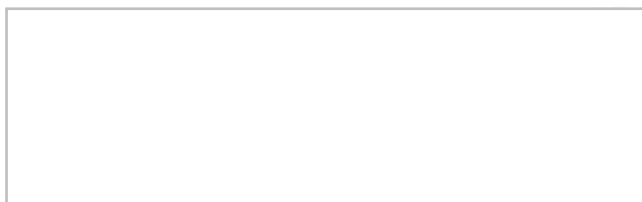


1971-1972  
1972-1973  
1979-1980  
1981-1982  
1983-1984  
1985-1986  
1988-1989

**AIAA Houston Section**  
**P.O.Box 57524**  
**Webster, TX 77598**



**Non-Profit Organization**  
**U.S. POSTAGE PAID**  
**Webster, Texas**  
**Permit Number 1**





**American Institute of Aeronautics and Astronautics**

HOUSTON SECTION P.O. BOX 57524 WEBSTER, TEXAS 77598

## **AIAA-HOUSTON SECTION**

# **19th ANNUAL TECHNICAL SYMPOSIUM**

CO-HOSTED BY

UNIV. OF HOUSTON-CLEAR LAKE, PROFESSIONAL & CONTINUING EDUCATION

***THEME: UNITING THE WORLD THROUGH AEROSPACE***

MAY 19, 1994

AT THE

UNIVERSITY OF HOUSTON - CLEAR LAKE

### **CALL FOR ABSTRACTS**

**DUE: MARCH 25, 1994**

---

#### **GUIDELINES FOR ABSTRACTS AND PRESENTATIONS**

1. Subject of your choice on aerospace activities. Suggested topics include: Communications Systems, Computer and Software Systems, Energy Systems, Simulation, Materials, Structures, Dynamics, Space Systems, Guidance, Navigation and Control, Life Sciences, Management, International Space Activities, Flight Mechanics, Space History, Human Support, Fluid Dynamics, Earth Observation, On-Orbit Operations, and Thermal Physics
2. The abstract should be 250 words or less. (Abstracts must be typed double spaced. Floppy discs are strongly encouraged; see attached example for format.)
3. Presentations should be 10 to 15 minutes. VU-graphs or 35 mm slides are preferred.
4. Formal publication is not required. However, please have handouts available at your presentation.
5. Include with your abstract:
  - Completed NASA Form FF427 or appropriate document availability authorization
  - All information on attached example
6. Submit abstracts or inquiries to:

Dudley Nelson, AIAA Vice-Chairman, Technical  
Lockheed Engineering and Sciences Co. / B25  
2400 NASA Rd. 1, Houston, TX 77058  
(713) 333 - 7054

---

## **EXAMPLE**

### **ARC-JET TESTING TO EVALUATE THE EFFECTS OF CONTINGENCY TRAJECTORIES ON THE ORBITER THERMAL PROTECTION SYSTEM**

**T. G. Pendergast  
I. Norman  
D. C. Chao  
J. D. Milhoan\*  
D. M. Curry\***

**Rockwell International  
\*NASA/Johnson Space Center**

A study to extend the orbiter contingency transoceanic abort landing (TAL) ranging capability to avoid a ditch/bailout is in progress. Some contingency entry trajectories that require lower angles of attack will cause high aeroheating rates on the shuttle thermal protection system (TPS).

This presentation will describe the low angle of attack entry trajectories being considered and the major problems incurred on the orbiter TPS. The surface entry environment that results from these trajectories may cause some mass loss of the carbon heat shield. A technical literature survey indicates the mass loss rate and surface recession depend on the surface temperature, pressure, enthalpy, chemical reactivity of the gaseous boundary layer, the flow geometry and the chemical reactivity of the carbon heat shield.

A program at the JSC Arc-Jet facility has been planned to investigate, by testing, carbon mass loss and performance of reinforced carbon-carbon (RCC) using RCC coated (TEOS/TYPE A) and uncoated test specimens. This presentation will discuss the status of testing and test philosophy.

**Presenter: T. G. Pendergast  
Phone Number: 483-XXXX  
Mail Code**

**EXAMPLE**





SHIRLEY BRANDT  
CHAIRMAN 1993-94

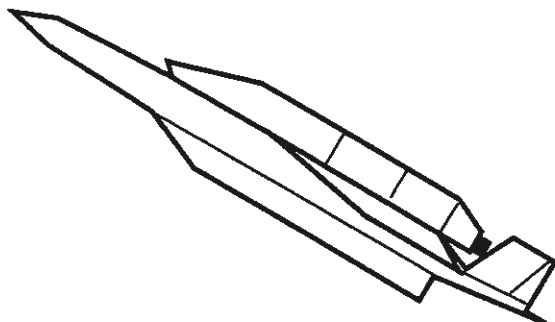
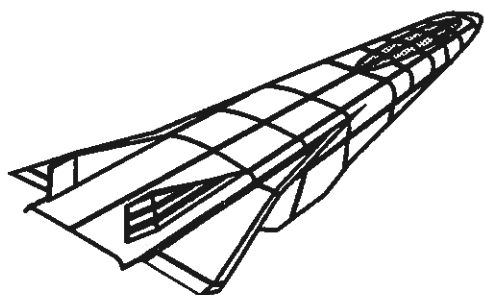
## American Institute of Aeronautics and Astronautics

HOUSTON SECTION P.O. BOX 57524 WEBSTER, TEXAS 77598

**Thursday, March 31, 1994**

### DESIGN CHALLENGES OF SEVERAL UNCONVENTIONAL AIRCRAFT

**Dr. JOHN RONCZ**  
**AIAA Distinguished Speaker**  
**CEO/President**  
**Gemini Technologies, Inc.**



**ROBERT R. GILRUTH RECREATION CENTER**  
**JOHNSON SPACE CENTER**

### PRESENTER / PROGRAM

John Roncz was born and raised in South Bend, Ind. He graduated from the University of Notre Dame in 1971 with an A.B. degree in Arts & Letters. John has always been intrigued by computers and learned to do aerodynamic work through his interest in computers. He began his aeronautical career in association with Burt Rutan by analyzing and designing airfoils for Rutan's Solitaire sailplane. In 1976, John founded Gemini Technologies, Inc. At the present time, Mr. Roncz has designed airfoils for 25 aircraft which have already been flight tested. The first to fly was a canard airfoil for the Long-EZ homebuilt. The latest to fly is Quiver, a very high altitude remotely piloted vehicle with several applications. John has received numerous awards, including the Stanley Dzik memorial trophy for outstanding design contributions from the Experimental Aircraft Association (EAA) and the Professor August Raspet award in 1990 by the EAA, which is its highest honor. His talk will look at some of the designs he has worked on over the years. He will explain the design goals of each plane, why his shapes were better than conventional shapes, and what problems needed to be solved to make it work properly.

### EXECUTIVE HOST

**Mike Hernandez**  
**CEO / President**  
**Hernandez Engineering, Inc.**

### DINNER MEETING

**SOCIAL: 5:30**  
**DINNER: 6:30**  
**PROGRAM: 7:30**

### MENU: SPAGHETTI with MEAT SAUCE

MEMBERS & SPOUSES	\$ 7.50
NONMEMBERS	\$ 8.00
STUDENTS/YOUNG MEMBERS	\$ 5.00
UNEMPLOYED MEMBERS	\$ 5.00

**FRANKIE HAP**  
**333-6064**  
**LOCKHEED**

**ARDELL BROUSSARD**  
**283-1040**  
**McDONNELL DOUGLAS**

**MARY ANN BIVONA**  
**483-1350**  
**RSOC**

**SARAH LEGGIO**  
**282-3160**  
**ALLIEDSIGNAL**

**CALL ONE OF THE ABOVE FOR RESERVATIONS.**

**NOTE: RESERVATION DEADLINE IS MONDAY, MARCH 28, AT 12:00 NOON.**  
**ANY CANCELLATIONS ARE REQUIRED PRIOR TO DEADLINE. NO-SHOWS WILL BE BILLED.**

**ALL ARE WELCOME**

**DINNER RESERVATIONS ARE NOT REQUIRED FOR ATTENDING THE PROGRAM ONLY.**

# CIRFFSS '94

AIAA/NASA Conference  
on Intelligent Robots in  
Field, Factory, Service, and Space

MARCH 21-24, 1994

South Shore Harbour Resort and Conference Center  
League City, Texas

## Sponsored by:

The American Institute of Aeronautics & Astronautics  
& the National Aeronautics and Space Administration,  
Johnson Space Center, Houston, Texas

In cooperation with the American Association for Artificial  
Intelligence, IEEE Robotics and Automation Society, National  
Service Robot Association, Robotic Industries Association,  
Society of Photo-Optical Instrumentation Engineers, AIAA  
Space Automation and Robotics Technical Committee, Clear  
Lake Council of Technical Societies, AIAA Houston Section,  
ISA Clear Lake Section, and IEEE Galveston Bay Section

## MONDAY

MARCH 21, 1994

**REGISTRATION** 7:30 AM  
**WELCOME** 8:30 AM  
**FIRST PLENARY SESSION** 9:00 AM

Sharing Technology in the National Interest *Paul J. Wertz,  
Associate Director, NASA Johnson Space Center*

Intelligent Robotics Can Boost America's Economic Growth  
*Jon Erickson, Chief Scientist, Automation and Robotics Division,  
NASA Johnson Space Center*

**OPENING KEYNOTE ADDRESS:** Technology for  
America's Economic Growth Includes Intelligent Robotics  
*Hon. Lionel Johns, Associate Director for Technology and Space,  
Office of Science and Technology Policy, Executive Office of the  
President of the United States*

Intelligent Robotics: The Technical Program *Lawrence  
Seldman, Department Head, MITRE Corporation, Houston*

**VIDEO TOUR** 10:15 AM  
NASA Johnson Space Center, Automation & Robotics  
Program

**CONFERENCE LUNCH** 12:00 Noon

**PARALLEL APPLICATION SESSIONS (4)** 1:30 PM

### Field Track: Nuclear Industry

Robots Are Coming (Have Come) to a Nuclear Plant Near  
You

Teleoperated Systems for Nuclear Reactors Inspection and  
Maintenance

ARK: Autonomous Mobile Robot in an Industrial  
Environment

Biologically-Inspired Hexapod Robot

A Vendor's Perspective on the Manufacture, Sale, and Use  
of Robotics at Nuclear Power Facilities

Odysseus Autonomous Walking Robot: The Leg/Arm  
Design

### Factory Track: Agile Manufacturing

A Vision Advisor System for Flexible Manufacturing

Application of the Modular Automated Reconfigurable  
Assembly System Concept to Adaptable Vision Gauging  
and Parts Feeding

Multiple Disk Load/Unload Sputter System

Agile Manufacturing and the Factory of the Future

Confessions of a Robot Lobotomist

Integration of Vision and Robotic Workcell

### Service Track: Security/Building Monitoring

Meeting the Challenges of Installing a Mobile Robotic System

Design of an Autonomous Exterior Security Robot

Task Automation in a Successful Industrial Telerobot

Controlling Multiple Security Robots in a Warehouse  
Environment

### Space Track: On-Orbit Applications I

Technology Transfer and Evaluation for Space Station  
Telerobotics

Space Flight Manipulator Technologies and Requirements  
as Developed for the NASA Flight Telerobotic Servicer

A Space Station Robot Walker and Its Shared Control  
Software

Technology Devel. for Robotic Surface Inspection in Space

A Highly Redundant Robot System for Inspection

Free-Floating Dual-Arm Robots for Space Assembly

Space Applications for Advanced Intelligent Telerobots

### EMERGING TECHNOLOGIES

5:00 PM

Reception, cheese and wine

## TUESDAY

MARCH 22, 1994

**PARALLEL TECHNOLOGY SESSIONS (3)** 8:00 AM

### Robotic Sensing, Vision, and Perception Track:

#### Vision & Sensing Technologies for Autonomous Robots

Design and Control of Active Vision Based Mechanisms for  
Intelligent Robots

Vision Based Object Pose Estimation for Mobile Robots

Simulation of an Application of an Old Method Mobile  
Robot Self Location to a New Sensor Model

Unsupervised Texture Image Segmentation by Improved  
Neural Network ART2

Microwave Vision for Robots

An Electromagnetic Noncontacting Sensor for Thickness  
Measurement in a Dispersive Media

Perception System and Functions for Autonomous  
Navigation in a Natural Environment

### Planning, Reasoning, and Control Track: Situated

#### Control and Low-Level Control

Fuzzy Logic Based Robot Controller

Vehicle Following Controller Design for Autonomous  
Intelligent Vehicles

The Real-World Navigator

A Streamlined Software Environment for Situated Skills

Situational Reaction and Planning

Autonomous Mobile Robot Teams

### Systems Technology and Architectures Track: Robotic Systems Architectures

Building Brains for Bodies

Object-Based Task-Level Control: A Hierarchical Control  
Architecture for Remote Operation of Space Robots

Task-Level Control for Autonomous Robots

A Survey of NASA and Military Standards on Fault  
Tolerance and Reliability Applied to Robotics

A Performance Analysis Method for Distributed Real-Time  
Robotic Systems: A Case Study of Remote Teleoperation

Predictive Sufficiency and the Use of Stored Internal State  
Using Generic Tool Kits to Build Intelligent Systems

### PARALLEL APPLICATION SESSIONS (4)

1:30 PM

Field Track: Environmental Restoration, Waste Management,  
and Hazardous Operation

The U.S. DoE Robotics Technology Development Program

Chernobyl Sarcophagus Today — A Robotics View from Inside  
The New Sarcophagus for Chernobyl

A Reactive System for Off-Road Navigation

The Road Plan Model — Information Model for Planning  
Road Building Activities

Design Reuse Experience of Space and Hazardous  
Operations Robots

A Multi-Mode Manipulator Display System for Controlling  
Remote Robotics Systems

### Factory Track: Robotic Remanufacturing

Programmable Automated Welding System

Robotic NDE Inspection of Advanced Solid Rocket Motor  
Casings

Automation for Nondestructive Inspection of Aircraft

Graphical Simulation for Aerospace Manufacturing

The Automated Aircraft Rework System (AARS) — A  
System Integration Approach

Automated Inspection of Turbine Blades

### Service Track: Healthcare

TRC Research Products: Components for Service Robots

An Update on 'Lab Rover': A Hospital Material Transporter

A Robot Wheelchair

Dexterity Enhancement in Microsurgery Using  
Telemicro-Robotics

The Role of Robotics in the ARPA Biomedical Technology  
Program

An Intelligent Robotic Aid System for Human Services

### Space Track: On-Orbit Applications II

An Intelligent Robot for Helping Astronauts

Terrestrial Applications of NASA Space Telerobotics  
Technologies

On-Orbit Spacecraft Servicing — An Element in the  
Evolution of Space Robotics Applications

A Modular Artificial Intelligence Inference Engine System  
(MAIS) for Support of On-Orbit Experiments

Panel Discussion: Future of Robotics in Manned Space

**Reception and Banquet with Keynote Address** 6:30 PM

"Application Driven Robot Technology" *Joseph Engelberger,  
Transitions Research Corporation, Danbury CT*

PARALLEL TECHNOLOGY SESSIONS (3) 8:00 AM

Robotic Sensing, Vision, and Perception Track:  
Vision Systems Integration and Architecture

- Real-Time Correlation-Based Stereo: Algorithm, Implementations and Applications
- Research on an Autonomous Vision-Guided Helicopter
- Real-Time Tracking of Objects for Space Applications Using A Laser Range Scanner
- Integration for Navigation on the UMass Mobile Perception Lab
- The 4-D Approach to Visual Control of Autonomous Systems
- Fusion of Sonar and Image Sensory Data for 3-D Modeling of the Free Navigation Space

Planning, Reasoning, and Control Track: Selective Perception and Human Robot Interaction

- Tele-Assistance for Semi-Autonomous Robots
- Mobile Robot Exploration and Navigation of Indoor Spaces Using Sonar and Vision
- Mobile Robot Navigation Using Neural Networks and Nonmetrical Environmental Models
- The Ground Vehicle Manager's Associate
- Deictic Primitives for General Purpose Navigation
- A Methodology for the Generation of the 2-D Map from Unknown Navigation Environment by Traveling a Short Distance

Systems Technology and Architectures Track: Robotic Systems Technologies

- Simplifying Applications Software for Vision Guided Robot Implementation
- An Open Architecture Motion Controller
- Telerobotics for Depot Modernization
- A Smart Telerobotic System Driven by Monocular Vision
- GA-Optimization for Rapid Prototype System Demonstration
- A Robot Control Formalism Based on an Information Quality Concept

CONFERENCE LUNCH 12:00 Noon

PARALLEL APPLICATION SESSIONS (4) 1:30 PM

Field Track: Military and Other Field Applications

- The Network Data Delivery Service: A Real-Time Data Connectivity System
- Robotics in a Controlled Environment Agriculture
- Robotic Hauling Truck for Surface Mining
- A Nonlinear Strategy for Sensor-Based Vehicle Path Control
- The Problem With Multiple Robots
- Survey Status of Military Ground Robotics

Factory Track: Dual-Use Precommercial Robotic Technology

- A Generic Telerobotics Architecture for C-5 Industrial Processes
- A Practical Method of Reverse Engineering and Automatic Path Programming for Robotic Surface Finishing
- Virtual Environments for Telerobotic Shared Control
- New Design Ideas for Modular Robots
- An Octahedral Hexapod as a New Machine Tool Solution

Designing the Next Generation of Robotics Controllers

Service Track: Building Operations

- An End User's Wishlist
- The First Commercial Floor Care Company that Ventured into the Production of Robotics
- Mobile Robots in the Workplace

Space Track: Planetary Exploration Applications

- Non-Geometric Hazard Detection for a Mars Rover CMU Rover
- Low Computation Vision-Based Navigation for a Martian Rover
- The 'Mity' Micro-Rover: Sensing, Control, and Operation
- Supervised Space Robots Are Needed in Space Exploration
- Multitasking Behavioral Control for the Robot All Terrain Lunar Exploration Rover (RATLER)

OPTIONAL SPECIAL EVENTS

TOUR SPACE CENTER HOUSTON 4:00 PM  
RECEPTION/DINNER 7:00 PM

See next page for details

THURSDAY MARCH 24, 1994

PARALLEL TECHNOLOGY SESSIONS (3) 8:00 AM

Robotic Sensing, Vision, and Perception Track:  
Vision Systems Integrations and Architecture II

- SAVA III: A Testbed for Integration and Control of Visual Processes
- An Architecture for Real-Time Vision Processing
- Motion Estimation of Objects in KC-135 Microgravity
- Real-Time Tracking of Objects in a KC-135 Microgravity Experiment
- Grasping Objects Autonomously in Simulated KC-135 Zero-G
- Object Tracking with Stereo Vision

Planning, Reasoning, and Control Track: Planning

- A Software Architecture for Hard Real-Time Execution of Automatically Synthesized Plans or Control Laws
- Finding All Feasible Plans Using Temporal Reasoning
- Integrating Deliberative Planning in a Robot Architecture
- Real-Time Robot Deliberation by Compilation and Monitoring of Anytime Algorithms
- Passive Mapping and Intermittent Exploration for Mobile Robots

Systems Technology and Architectures Track: New Directions in Robotic Systems

- Extensibility in Local Sensor-Based Planning for Hyper-Redundant Manipulators (Robot Snakes)
- Fault-Tolerant Kinematic Control of Hyper-Redundant Manipulators
- Failure Tolerant Operation of Kinetically Redundant Manipulators
- UM-PRS: An Implementation of the Procedural Reasoning System for Multirobot Applications
- Control of Parallel Manipulators Using Force Feedback

Robust Inverse Kinematics Using Damped Least Squares with Dynamic Weighting  
ControlShell: A Real-Time Software Framework

SECOND PLENARY SESSION 12:30 PM

Commercialization  
chaired by Gene Kozmetsky, President of IC<sup>2</sup>, University of Texas at Austin, Texas

- Lyndon B. Johnson Space Center (JSC) Proposed Dual-Use Technology Investment Program in Intelligent Robotics
- Case Study: Concurrent Research and Commercialization of Modular Robots
- Part 1 — Research Requirements
- Part 2 — Correlating Modular Designs with Requirements
- Part 3 — A Feasible Business Plan
- Examples of Robotic Technology Commercialization
- Examples of Virtual Reality and Robotics
- Panel Discussion and Q&A: How to Use NASA Technology

OPTIONAL SPECIAL EVENTS

SPACE CENTER HOUSTON is the new visitors center at the NASA Johnson Space Center. Designed by Disney Imagineering, this center has an IMAX Theater and hands-on interactive exhibits and displays. It will be the site of a tour as well as the reception/dinner on Wednesday, March 23. The tour, lasting from 4:00-6:00 PM, will include the Johnson Space Center via tram; the cost is \$10.00. The tour and dinner, lasting from 4:00-8:00 PM, will include a private showing of an IMAX film; the cost is \$25.00. For those who wish to attend only the dinner and IMAX film, the cost is \$15.00.

SPOUSE PROGRAM

A SHOPPING SPREE on Monday, March 21, will depart from the South Shore Harbour Resort and Conference Center at 10:30 AM and will return at 4:00 PM. The cost is \$25.00 per person. The itinerary will include the Lone Star Factory Outlet Stores, which include 40 of America's best known manufacturers with Texas-sized savings. In the afternoon, you will travel to Old Seabrook, rich in history from the early 1800s, now a local arts and antiques colony.

VISIT THE MOODY GARDENS Rain Forest in Galveston on Wednesday, March 23. The bus departs at 10:00 AM and returns at 3:00 PM. Cost is \$35.00 per person which includes a gourmet meal and acres of gardens and trails to explore. You will visit the ten-story Rain Forest Pyramid with over 2,000 species of exotic plants, animals, and butterflies from Asia, Africa, and the Americas.

CONFERENCE LOCATION/TRANSPORTATION

THE SOUTH SHORE HARBOUR Resort and Conference Center is located in the Clear Lake/League City area of Houston. The hotel is 25 minutes southeast of Hobby Airport, 15 minutes from Ellington Field, and an hour from Intercontinental Airport. Call 713/334-1000 for reservations. AIAA conference room rates are \$100 regular (s/d), or \$90 government per diem rate (s/d; ID required). South Shore Harbour also provides complimentary pick-up and delivery to Hobby Airport and Ellington Field for registered hotel guests. If you require this service, you will need to make reservations at least 48 hours in advance. Call 713/334-1000, ext. 2054, and ask for the bell stand.



**THE THEME OF CIRFFSS '94** is "Sharing Technology in the National Interest." The response to President Clinton's initiatives to take a new direction in building economic strength for America by using closer relationships between government and private industry through partnerships, consortia, and collaborations. These relationships will enable us to capitalize on government research and development in commercial enterprises and thereby, to increase America's global competitiveness and to create and preserve jobs. The NASA Johnson Space Center is cosponsoring CIRFFSS '94 to encourage the sharing of intelligent robotics technology at the precommercial, dual use stage of development by forming multiple new relationships.

We hope you will come to CIRFFSS '94 with the idea of forming new partnerships between or among buyers, users, manufacturers, integrators, and technology developers of intelligent robotics. The NASA Johnson Space Center is eager to work with others, particularly those in industry wanting to use intelligent robotics technology developed for space in commercial applications on earth.

Paul J. Weitz

Acting Director, NASA Johnson Space Center

#### REGISTRATION FOR CIRFFSS '94

All participants are urged to use the advance registration form found in the December 1993 AIAA Bulletin, or the abbreviated form on the reverse of this page. Registering in advance saves conference attendees \$50. Early Bird registration forms, accompanied by check, money order, or credit card information, must be received by February 21, 1994. Preregistrants may pick up their materials at the advance registration desk. Late registration will be available at the onsite registration desk. For additional information, please call 202/646-7463.

Nonmember participants who qualify for AIAA membership and pay the full nonmember fee will receive a one-year membership and Aerospace America each month by completing a membership application form, available from American Institute of Aeronautics and Astronautics Department No. 0018

Washington, DC 20073-0018

This offer is valid within six months of conference start date.

#### CONFERENCE PROCEEDINGS

BOUND VOLUMES of the CIRFFSS '94 proceedings are complimentary to conference attendees and will be distributed at the conference. Additional copies may be ordered by contacting:

NASA Center for Aerospace Information

800 Elkridge Landing Road

Linthicum Heights, Maryland 21090

(301) 621-0390

Call for prices.

#### REGISTRATION FEE OPTIONS ARE AS FOLLOWS:

	By 2/21/94	After 2/21/94
Option 1: Full Conference*		
Member	\$300	\$350
Nonmember	\$420	\$470
Option 2: Full-Time Student**		
Member	\$0	\$0
Nonmember	\$25	\$25
Option 3: Full-Time Retired**		
Member	\$0	\$0
Nonmember	\$25	\$25
Option 4: Block***	\$185	N/A
Option 5: Spouse		
Monday Shopping \$25		Wednesday Rain Forest \$35
Option 6: Special Event		
Space Center Houston Tour only	\$10 each	
Tour, dinner, and IMAX film	\$25 each	
Dinner and IMAX film only	\$15 each	

Extra Lunch Tickets: \$15 each, Banquet Tickets: \$35 each

\* Includes session participation, lunch on Monday and Wednesday, Monday evening reception, Tuesday banquet, and one copy of the conference proceedings.

\*\* Includes session participation only.

\*\*\* Advance only. 10 or more from the same organization. Includes session participation only.

CIRFFSS '94 — MARCH 21 - 24, 1994

#### REGISTRATION FORM

MAIL TO: AIAA, Department No. 0018, Washington, DC 20073-0018

Badge Name: First \_\_\_\_\_ M.I. \_\_\_\_\_ Last \_\_\_\_\_

Job Title/Rank: \_\_\_\_\_ Daytime Phone Number: \_\_\_\_\_

Co. Name: \_\_\_\_\_

Mailing Address: ( ☐ Business ☐ Home ) \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Country/Zip/Postal Code: \_\_\_\_\_

INDICATE REGISTRATION OPTION(S) BELOW. PAYMENT BY CHECK, CREDIT CARD, OR MONEY ORDER, PAYABLE TO AIAA, MUST ACCOMPANY REGISTRATION.

OPTION:	AMOUNT:	OPTION:	NO.	AMOUNT:
<input type="checkbox"/> 1: FULL CONFERENCE	_____	<input type="checkbox"/> 6: SPECIAL EVENT	_____	_____
<input type="checkbox"/> 2: FULL-TIME STUDENT	_____	TOUR ONLY	_____	_____
<input type="checkbox"/> 3: FULL-TIME RETIRED	_____	TOUR, DINNER, IMAX	_____	_____
<input type="checkbox"/> 4: BLOCK (ADVANCE ONLY)	_____	DINNER, IMAX ONLY	_____	_____
<input type="checkbox"/> 5: SPOUSE SHOPPING	_____	EXT. LUNCH <input type="checkbox"/> MON <input type="checkbox"/> WED	_____	_____
SPOUSE RAIN FOREST	_____	EXT. BANQUET <input type="checkbox"/> TUES	_____	_____



**American Institute of Aeronautics and Astronautics**

HOUSTON SECTION P.O. BOX 57524 WEBSTER, TEXAS 77598

## **Spirit of Apollo Scholarship**

### **AIAA Houston Section Scholarship Program, 1994-95**

The Houston Section of the AIAA is pleased to announce the **Spirit of Apollo Scholarship** for the 1994-95 school year in the amount of \$1000. The first half (\$500) will be available for the Fall Semester. The second half (\$500) will be available for the Spring Semester. Eligibility requirements must be met for both the Fall and Spring semesters.

#### **OBJECTIVE**

The objective of the American Institute of Aeronautics and Astronautics (AIAA) is to advance the arts, sciences, and technology of aeronautics and astronautics.

The AIAA encourages original research, furthers dissemination of new knowledge, fosters the professional development of those engaged in scientific and engineering activities, improves public understanding of the profession and its contributions, fosters education in engineering and science, promotes communication among engineers and scientists and with other professional groups, and stimulates outstanding professional accomplishments.

#### **ELIGIBILITY**

The following eligibility requirements shall be met by the applicants for the AIAA/Houston Section Scholarship award:

1. Applicant must have completed at least one academic year of full-time college work at the time of receiving the scholarship.
2. Applicant must have a college grade point average of not less than 3.0 on a 4.0 scale.
3. Applicant shall be enrolled in an accredited college or school.
4. Applicant's scholastic plan shall be such as to provide entry into some field of engineering or science (i.e., physical science, mathematics, or computer science) which is pertinent to the technical activities of the AIAA.
5. Applicant shall not have, or subsequently receive, any other scholarship award which, combined with the AIAA award, would provide a stipend greater than the tuition plus direct educational expenses (such as books, lab fees, etc.) estimated by the educational institution he or she plans to attend.
6. Students who receive an award are eligible to reapply in succeeding years. It should be stressed that regardless of GPA, renewal is not automatic. To apply for renewal, and individual must follow the application procedure indicated below.
7. Applicants must be either U.S. citizens or permanent residents of the U.S.

## **SELECTION CRITERIA**

The recipients of the scholarship awards will be selected using the following criteria, which are listed in order of importance:

**1. Scholarship**

This criterion will be evaluated on the basis of the applicant's grade point average or equivalent. A grade point average of not less than 3.0 (B) will be required.

**2. Personal Assessment of Career Goals**

This criterion will be evaluated through a 500-1000 word typewritten essay. The essay should specify the career objectives of the applicant and should outline the academic program required to achieve those career objectives.

**3. Recommendations**

Each applicant will be judged on personal and academic merit, based on letters of recommendation.

**4. Extra-curricular Activities**

Each applicant's high school, college, and community activities, offices, awards, and work experience will receive due consideration.

## **APPLICATION PROCESS**

Each applicant will provide the following information:

1. A completed application form.

2. A current college transcript.

3. Each new applicant must include no more and no less than three typewritten letters of recommendation. Individuals seeking renewal shall supply two and only two letters. Recommendations from relatives will not be accepted. The letters of recommendation may be attached to the application or sent under separate cover at the address indicated below. Recommendations must be post-marked no later than the due date of the application.

4. A 500-1000 word typewritten essay as described in selection criteria.

The Applications (including transcripts, essays, etc.) for the next academic year must be post-marked no later than 2 May of the current academic year.

Applications and related materials should be addressed to:

Chairman, Scholarship Program  
AIAA-Houston Section  
American Institute of Aeronautics and Astronautics  
P.O. Box 57524  
Webster, TX 77598

### ADMINISTRATION OF THE SCHOLARSHIP PROGRAM

The AIAA-Houston section's scholarship committee will be responsible for selecting the recipients of the awards.

### SELECTION OF THE SCHOLARSHIP RECIPIENTS

The decisions of the AIAA Scholarship committee are considered to be final and the winner for the next academic year will be advised of the outcome by 13 May of the current academic year.

### DISBURSEMENT OF THE SCHOLARSHIP FUNDS

Disbursement of the scholarship awards shall be made in the form of a check in the name of the recipient and sent to the educational institution of the selected candidate. Educational institutions attended by the recipients will be notified of the scholarship awards, so that the institutions can coordinate the financial resources of the recipients.

American Institute of Aeronautics and Astronautics  
- Houston Section -  
Application for Scholarship  
1994-95

[Please print or type. If additional space is necessary, continue on a separate sheet.]

**Personal Information**

Name: \_\_\_\_\_ Soc. Sec. number: \_\_\_\_\_

Local Address: \_\_\_\_\_  
no. & street

\_\_\_\_\_ Telephone: (\_\_\_\_) \_\_\_\_\_  
city state zip

Date of Birth: \_\_\_\_\_ School Telephone: (\_\_\_\_) \_\_\_\_\_

Citizenship: ☐ U.S. Citizen ☐ Permanent Resident of the U. S.

Current Class Rank: \_\_\_\_\_ out of \_\_\_\_\_

List your educational experience to date:

<u>Name of High School or College</u>	<u>Dates Attended</u>	<u>Graduation Date</u>	<u>Degree</u>	<u>GPA</u>
_____	_____	_____	_____	_____ out of _____
_____	_____	_____	_____	_____ out of _____
_____	_____	_____	_____	_____ out of _____

Indicate the school year for which the scholarship is requested:  
☐ Sophomore ☐ Junior ☐ Senior ☐ Graduate

Degree sought (major): \_\_\_\_\_

**Activity and Employment Information**

List High School, College, and Community activities, including offices held and/or awards:

<u>Organization</u>	<u>Offices/Awards</u>	<u>Dates of Involvement</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

List work experience during the last four years:

<u>Type of work</u>	<u>Employer/Company</u>	<u>Dates of employment</u>
_____	_____	_____
_____	_____	_____

Signature of applicant \_\_\_\_\_ Date \_\_\_\_\_