

Chairman's Corner

Shirley Brandt
Chairman

THIS ADMINISTRATIVE YEAR HAS BEEN a learning experience for the officers and council members of the local Section. The downsizing in the aerospace industry has caused us to reevaluate our programming focus. In addition to providing the traditional programs such as the monthly dinner meetings, the technical committee lunch and learns, and the technical symposiums, this administration has been evaluating additional programs to help the displaced aerospace workers. Some of our members have been caught in the reduction in force, and the Section has the responsibility to provide help in their job search.

The Displaced Worker Workshop, which was conducted during the month of January, is being reworked to remove the duplication provided by other resources. The Section would like to organize additional programs which would be beneficial to the Houston Section's unemployed community. We are looking for ideas for productive programs, and would appreciate any suggestions.

Please forward any programming suggestions to me at the Section mailing address. **✉**

Don't Forget to Vote!

George Nield
Chairman-Elect

IF YOU HAVEN'T ALREADY SEEN IT, you will shortly be receiving your ballot for this year's Houston Section elections. When you get it, please take the time to read through the information so that you can make an informed decision on the candidates. Then mark your ballot and put it in the mail as soon as you can. Your vote does make a difference, so don't let it go to waste! **✉**

"Now What Do We Do?"

George Nield
Chairman-Elect

IT'S NOT TOO EARLY TO START THINKING about Section activities for next year. If you have some ideas on events that you would like to see us sponsor, please contact George Nield, Chairman-Elect, at 483-1364. Here are some possibilities, just to get your imagination rolling:

- An electronic bulletin board for discussion of space issues
- A field trip to the Hobby airport control tower
- A Fun Run
- Special classes on topics of interest (spacecraft design, project management, financial planning, Internet access, etc.)
- Guided tours of JSC facilities (the altitude chamber, WETF, thermal-vacuum chamber, Ellington flight line, etc.)
- A public forum on Space and the News Media, featuring local TV and newspaper reporters. **✉**

In This Issue...

Chairman's Corner	1
Been There, Done That...25 Years Ago	2
Who's Who	2
Education	3
Events	4
AIAA Calendar	6

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.

Been There, Done That . . . 25 Years Ago

David S. F. Portree
History/Heritage Committee

IN MAY 1969 PREPARATIONS FOR THE FIRST MANNED LUNAR LANDING reached a fever pitch. Apollo 10 led the way.

Apollo 10 splashes into ocean on target

"Precisely 8 days and 3 minutes after their lunar launch on May 16, Apollo 10 crewmen Tom Stafford, John Young, and Eugene Cernan splashed into...the South Pacific, 399 miles from American Samoa. Apollo 10, which ventured closer to the moon than man has ever been, received the traditional hero's welcome... The mission's valuable cargo of...data...will hopefully pave the way for an Apollo 11 lunar landing mission now scheduled for launch July 16." (Excerpted, *Space News Roundup*, May 30, 1969)

Unofficial countdown to July landing anticipates 'go-ahead' from Apollo 10

"Everyone is counting. 56, 55...if Apollo 10 was as successful under study as it seemed in real-time...54, 53...and if Apollo 11 is at least as smooth sailing as was the 10 mission...52, 51...then lunar landing looms 50 days away.


"While a definite commitment has not been made concerning the landing of Apollo 11, preparations for the flight...never skip a beat. So, as Apollo 10 was still gliding toward the moon, the Apollo 11 hardware, three Saturn V stages topped by the spacecraft itself, were being rolled out from the Merritt Island Launch area to Kennedy Space Center's Pad 39A.

"The...study of Apollo 10 data will fill a large part of the coming weeks for those involved in Apollo 11. The information gleaned from the 'rehearsal' mission will be a large determinant in the Apollo 11 schedule." (Excerpted, *Space News Roundup*, May 30, 1969)


Veteran X-15 retires in honor to Smithsonian

"The No. 1 X-15, America's first major investment in manned aerospace flight technology, is being retired to a berth in the Smithsonian Institution, right next to Wright's [flyer] and the Spirit of St. Louis. The 10-year-old test vehicle was part of a series of rocket research planes designed for manned hypersonic flight research. In 199 missions since June 1959, The X-15 established two unofficial world records—flying an altitude of over 67 miles and 6.7 times the speed of sound.

"In addition...the X-15 helped develop vital aeronautical and space flight systems, materials, instrumentation, space suits, and flight techniques—making it possible to accelerate the Mercury, Gemini, and Apollo programs.

"Two of the 12 test pilots for X-15 were astronauts Joe Engle and Neil Armstrong (Apollo 11 commander)." (Excerpted, *Space News Roundup*, May 2, 1969) 

Who's Who

DR. ANGELO MIELE (F) HAS BEEN ELECTED a member of the U. S. National Academy of Engineering. He has also been elected a Foreign Member of the Russian Academy of Sciences. Miele, a member of AIAA since 1952, is A. J. Foyt Professor Emeritus of Engineering, Aerospace Sciences and Mathematical Sciences at Rice University. 

Note — The Honors & Awards Banquet will be held on June 2, not June 30, and at Space Center Houston, not the Gilruth Center.

Education

University of Houston Summer & Fall Courses

THE UNIVERSITY OF HOUSTON ANNOUNCES graduate courses in Industrial Engineering and Aerospace Engineering for the summer and fall terms.

Summer 1994

Courses via TV Received at JSC, Bldg. 45

Classes begin Monday, June 6, 1994. Room assignments are to be posted in building 45, room 146.

ELEE 6342/05209

Digital Signal Processing

Instr.: B. Janses

4:00 - 6:00 PM Monday/Wednesday

INDE 6361/05211

Management & Organization Production

Instr.: J. Hunsucker

4:00 - 6:00 PM Tuesday/Thursday

Advising/registration Friday, April 29, 1994, 10:30 AM - 2:00 PM, JSC Bldg. 45 Lobby. For information, call the Office of the Dean of Engineering, 743-4200, or the JSC Training Office, 483-3075.

Fall 1994

Courses Offered at UH-Clear Lake

Classes begin Thursday, August 25, 1994. Building and room numbers are to be assigned.

Required courses in Industrial Engineering:

INDE 6332/06547

Engineering Project Management

Instr.: J. Hunsucker

4:00 - 7:00 PM Monday

INDE 6365/06548

Engineering Economy II

Instr.: J. Hunsucker

4:00 - 7:00 PM Wednesday

Courses in Aerospace Engineering:

MECE 7397/06553

Composite Materials

Instr.: S. S. Wang

4:00 - 7:00 PM Tuesday

MECE 7397/06554

High Speed Aerodynamics

Instr.: C. Li

4:00- 7:00 PM Thursday

Fall 1994

Courses via TV Received at JSC, Bldg. 45

Room assignments are to be posted in building 45, room 146.

CIVE 6361/06637

Ground Water Hydrology

Instr.: T. Cleveland

5:30 - 7:00 PM Monday/Wednesday

ELEE 6397/06551

Computer Design & Architecture

Instr.: J.-A. Lee

12:00 - 1:30 PM Monday/Wednesday

ELEE 7373/06552

Advanced Topics in Computer Architecture

Instr.: P. Markenscoff

11:30 AM - 1:00 PM Tuesday/Thursday

ENGI 6362/06555

Methods of Applied Mathematics

Instr.: L. Wheeler

4:00 - 5:30 PM Monday/Wednesday

INDE 6368/06568

Advanced Statistics Seminar

Instr.: D. Deal

4:00 - 5:30 PM Tuesday/Thursday

INDE 6380/06550

Topics in Industrial Automation

Instr.: J. Chen

5:30 - 7:00 PM Tuesday/Thursday

Advising/registration Friday, April 29, 1994, 10:30 AM - 2:00 PM, JSC Bldg. 45 Lobby. For information, call the Office of the Dean of Engineering, 743-4200, or the JSC Training Office, 483-3075. ♣

Thanks

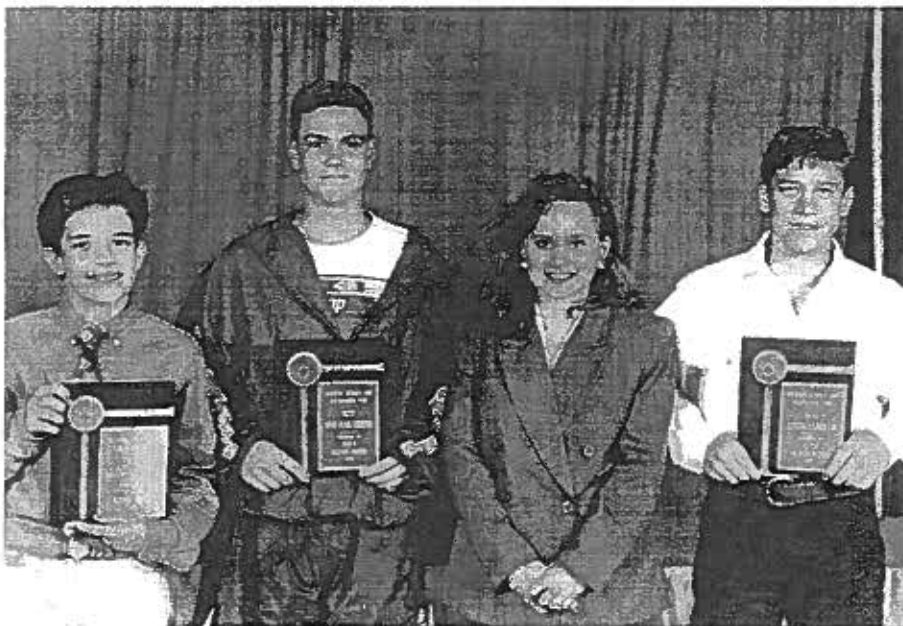
Bill Best
Mailout Committee Chairman

As chairman of the AIAA Mailout Committee, I am as fully aware as anyone of the tremendous job done by the willing volunteers to enable the rest of the membership to receive their copy of *Horizons* each month.

Jim McLane, Shirley Brandt, John Trebes, George Nield, Tek Shrini, Steve Zobal, Dennis Halpin, Lou Livingston, and Dick Bennett have been the "regulars" with assists from others when available. These people deserve the thanks of the entire section for their efforts. We not only get the newsletter ready for mailing but we propose solutions for the world's problems and earn a discount for the local section's dinner meetings. Join us and also learn a valuable skill—newsletter folding. Call me at 282-6970. ♣

Pictured left to right are Travis Kelley, Senior Division winner, Greg Hagemann, Ninth Grade Division winner, Susan Cisneros Vascoe, award presenter for AIAA, and Stanford McGee, Junior Division winner.

Photo by Katy Damon Photographics



Events

35th Science Engineering Fair of Houston

Susan Cisneros Vascoe
Student Affairs Chairman

On March 25, 1994, AIAA served as a Special Awarding Agency in the 35th Science Engineering Fair of Houston. Dr. Zafar Taqvi, Gillian Parker, Mike Begley and Susan Cisneros Vascoe participated as judges. They judged primarily aerospace-related projects that were in the Earth/Space Science and Engineering categories. Three first place plaques were awarded for the Junior (7th and 8th grades), Ninth, and Senior (10th, 11th and 12th grades) Divisions. Some of the categories they judged on were Creativity and Originality, Project Design, Knowledge and Understanding of the scientific or engineering principles, and Project Execution.

The winner from the Junior Division was Stanford McGee, an 8th grader from West Columbia Junior High. His project was entitled "Hovercrafts." The first place winner in the Ninth Grade Division was Greg Hagemann, a student of the Academy of Science and Technology. The name of his project was "Turbulators: An Uplifting Experience." Our Senior Division first place award was given to Travis Kelley, a 10th grader from Terry High School. His project was entitled "The Damage of Space Junk III."

For those of you who were unable to participate in this year's judging, I suggest volunteering next year. It's a lot of fun and it's quite an educational experience. ♣

WAR '94

Jed Login
Automation & Robotics TC

THE 10TH ANNUAL WORKSHOP ON AUTOMATION AND ROBOTICS (WAR '94) was opened by Dr. Zafar Taqvi, Chairman of the Houston Section Automation and Robotics Technical Committee (A&R TC). Because the A&R TC had already sponsored CIRFFSS '94 just a few weeks ago, this year's program consisted of tutorials on new technologies in automation and robotics, a deviation from the normal program which also included panel discussions.

Shirley Brandt, Houston Section Chairman, welcomed the attendees on behalf of the Section. She noted that our section A&R TC was formed long before either the AIAA National TC or the JSC A&R Division. She thanked the A&R Division for their continued support of WAR. The NASA/JSC A&R Division under Charles Price, Dr. Reg Berka and the Clear Lake Section of the Instrument Society of America cosponsored this successful workshop.

The four tutorials presented were: "Fuzzy Theory and Applications" by Dr. Jack Aldridge of Advan-Tex, Inc.; "Redundant Manipulators" by Dr. Nazareth Bedrosian, MIT Draper Lab.; "Applications of Wavelet Computational Mathematics" by Dr. Ronnie Wells, Jr., Professor of Mathematics at Rice University; and "Plenty of Intelligence to Go Around" by Dr. R. Peter Bonasso of The Mitre Corp.

Dr. Aldridge described the progression of theory and applications of fuzzy logic since 1965. Problems with crisp boundaries using numerical inputs result in slow processing. Fuzzy numbers can require less processing and are therefore more efficient. Fuzzy logic can even be applied to areas demanding black or white decisions by clarifying data utilized for those decisions. By more efficiently processing information, fuzzy logic has even broader usage. One application included air conditioning with 24% greater efficiency and longer life. Another achieved

much more precise etching when applied to plasma etching machines.

Dr. Bedrosian outlined the use and benefits of hyperredundant controls and associated concepts. He described how they apply to robotic arms with more degrees of freedom than the minimum required for a task. An important application is minimizing the movement of a payload attached to a robotic arm, given that one joint has failed. He presented the mathematics necessary to calculate whether it was possible and which series of joint movements to use. Examples ranged from a planar manipulator to self motion with an 11 degree of freedom manipulator.

Dr. Wells introduced wavelets. He described many applications including superior data compression, an area of significance to image transmission and pattern recognition for robotic vision. Impressive compression ratios result with almost undetectable error: audio, 8:1; still images, 20:1; and video as much as 140:1. Other applications included a hospital providing highly specialized consultations all over the world by means of electronically transmitted CAT scans, X-ray images, and other medical data.

After the luncheon, Dr. Bonasso described the application of three-tiered intelligent architecture to the ARMS Facility. He outlined three areas of human intelligence considered essential for intelligent robotics. These areas are coping through routine, use of standard operating procedures, and the ability to plan a set of procedures before undertaking a big or costly endeavor. The benefits are:

1. Providing a principled approach to robotic development
2. Uniform high level interface for many branch systems
3. Run time flexibility
4. Explicitly representing safety at the highest level and promulgating it to the lowest levels.

The presentations were well received. A compilation will be sent to all registered participants. Next year's WAR is scheduled for the third week of March. ■

Return to the Moon by 1997?

Jed Login
Automation and Robotics TC

At CIRFFSS '94 I HAD THE OPPORTUNITY to meet Dr. Red Whittaker, Director of the Field Robotics Center (FRC) at Carnegie Mellon University. He had just delivered a presentation about the Lunar-Trek Project. This mission will send a lunar rover back to the Moon by the year 1997 on a 1000 km traverse over two years, visiting the historic landing sites of Apollo 11, Ranger, Surveyor and Lunakhod. A team of students is participating in the design. Unlike most student projects, this is not merely a design exercise, but is intended to culminate in an actual mission to the moon.

As a part of this effort, they are reaching out to potential partners, associates and technology centers for information on existing space-hardened components and subsystems. They would like to establish a dialog with interested people and organizations.

More information can be obtained from:

Lunar Rover Technical Outreach
c/o Red Whittaker
Field Robotics Center
Carnegie Mellon University
Pittsburgh, PA 15213-3890
E-mail: lalit@ri.cmu.edu
Fax: (412) 682-1793
Phone: (412) 268-6556

I believe their request is not only of interest to Houston AIAA members but an area in which our members can contribute. I have also been in communication with Lalitesh Katragadda, the Course Associate for the Lunar Rover Design group and have additional information. If any readers would like to contact me locally, my number is 286-5831 and my E-mail address is csci21a2@d.uh.edu.

Look for more details in next month's *Horizons*. 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. It will also include committee meetings, Lunch & Learns and similar events if *Horizons* hears about them in time for inclusion. Please send pertinent details to Lou Livingston, 1911 Pepper Hill, Houston, TX 77058.

May

19 - Thursday

19th Annual Technical Symposium.
"Uniting the World Through Aerospace."
UHCL, all day.
Information: Dudley Nelson, 333-7054.

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

31 - Tuesday

Horizons inputs for June due COB.

June

2 - Thursday

Annual Honors & Awards Banquet.
"Perspectives on Space Technology," Dr. Kumar
Krishen, Chief Technologist, JSC.
Space Center Houston, 5:30/6:30/7:30.

23 - Thursday

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

H

OUTSTANDING SECTION AWARD

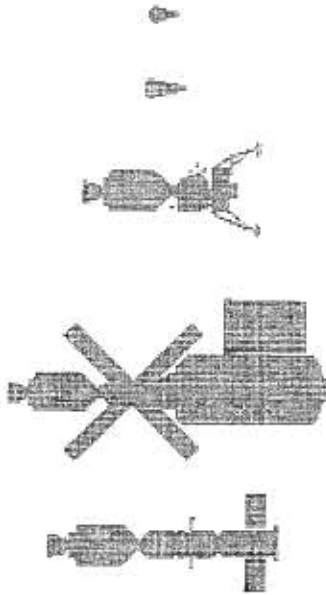


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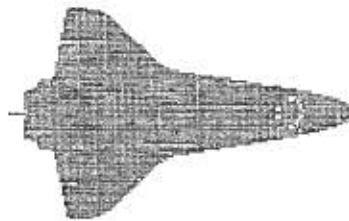
SECTION SPECIAL EVENT AWARD



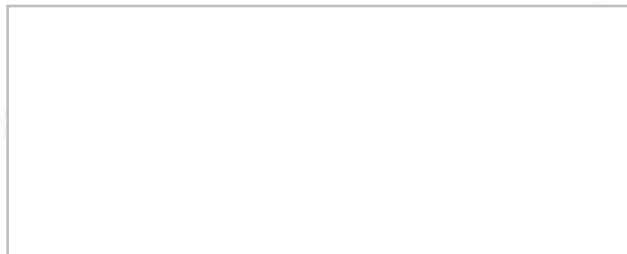
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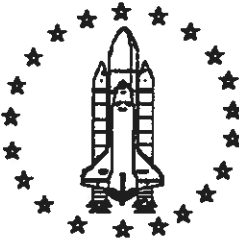




American Institute of Aeronautics and Astronautics

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

HOUSTON SECTION 19TH ANNUAL TECHNICAL SYMPOSIUM UNITING THE WORLD THROUGH AEROSPACE



CO - HOSTED BY AIAA HOUSTON AND
THE UNIVERSITY OF HOUSTON - CLEAR LAKE
PROFESSIONAL AND CONTINUING EDUCATION



THURSDAY, MAY 19, 1994
AT THE UNIVERSITY OF HOUSTON - CLEAR LAKE

General Chairman
MIGUEL A. HERNANDEZ, JR., P.E.
CEO / President
Hernandez Engineering, Inc.

Keynote Speaker
MICHAEL CONLEY
JEM and APM Launch
Package Manager
NASA / Johnson Space Center

Plenary Speaker
FRANK J. MUSIL
Space Station Analysis &
Integration Team Leader
Boeing Defence & Space Group

8:00 Registration / Continental Breakfast
(Bayou Building First Floor)
\$2 AIAA Members, \$3 Nonmembers

8:40 - 9:25 Opening Session (Room 1313)

Featuring:
Mr. MICHAEL CONLEY

9:30 - 12:00 Concurrent Symposium Morning
Sessions
(Presentations will start at 20 minute intervals)

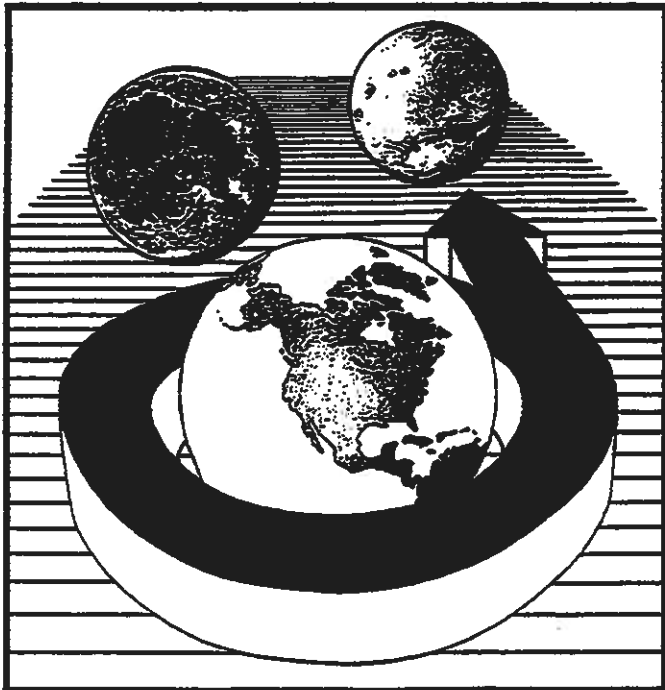
12:00 - 1:40 Lunch Break
(Food available at the UHCL cafeteria)

1:40 - 3:40 Concurrent Symposium Afternoon
Sessions

3:50 - 4:50 Plenary Session (Room 1313)

Featuring:
Mr. FRANK J. MUSIL

5:00 PLENARY RECEPTION
(Bayou Building Atrium I)
OPEN TO ALL SYMPOSIUM ATTENDEES



For more information contact:
Program Chairman
Dr. DUDLEY NELSON
(AIAA-Vice Chairman, Technical)
Lockheed Engineering & Sciences Co.
333 - 7054



American Institute of Aeronautics and Astronautics

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

HOUSTON SECTION ANNUAL HONORS AND AWARDS BANQUET

THURSDAY, JUNE 2, 1994

SPACE CENTER HOUSTON

GUEST SPEAKER

Dr. Kumar Krishen

Chief Technologist

NASA / Johnson Space Center

"Perspectives On Space Technology"

DINNER MEETING

SOCIAL: 5:30

DINNER: 6:30

PROGRAM: 7:30

BUFFET MENU

FISH, CHICKEN, BEEF

VEGETABLES

SALAD

MEMBERS & SPOUSES	\$13.50
NONMEMBERS	\$14.50
STUDENTS /YOUNG MEMBERS	\$ 7.00
UNEMPLOYED MEMBERS	\$ 7.00

FRANKIE HAP
333-6064
LOCKHEED

ARDELL BROUSSARD
283-1040
McDONNELL DOUGLAS

MARY ANN BIVONA
483-1350
RSOC

SARAH LEGGIO
282-3160
ALLIEDSIGNAL

**NOTE: THE DINNER RESERVATIONS DEADLINE IS FRIDAY, MAY 27, AT 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.



AIAA 19th ANNUAL TECHNICAL SYMPOSIUM
TECHNICAL SESSION INDEX
UNIVERSITY OF HOUSTON-CLEAR LAKE, BAYOU BUILDING (1st Floor)
MORNING SESSION 9:40 AM TO 12:00 AM

OPENING PROGRAM: 8:40 - 9:30 A.M. BAYOU BLDG. ROOM 1313

SESSION NUMBER	SESSION TITLE	ROOM NUMBER	SESSION CHAIRPERSON
1	COMMUNICATIONS AND TRACKING	1302	Dr. Kumar Krishen
2	COMPUTER AND SOFTWARE SYSTEMS	1306	Jerry Poel
3	STRUCTURAL DESIGN	1311	Don Probe
4	SPECIAL TOPICS I	1324	Shirley Brandt
5	STRUCTURAL METHODS I	1313	Steve Scheer
6	GUIDANCE, NAVIGATION AND CONTROL	1333	Dave Clark
7	MANAGEMENT I	1335	Dr. John Hunsucker
8	HUMAN FACTORS	1326	Dr. Frances Mount



AIAA 19th ANNUAL TECHNICAL SYMPOSIUM
TECHNICAL SESSION INDEX
UNIVERSITY OF HOUSTON-CLEAR LAKE, BAYOU BUILDING (1st Floor)
AFTERNOON SESSION 1:40 PM TO 3:40 PM

SESSION NUMBER	SESSION TITLE	ROOM NUMBER	SESSION CHAIRPERSON
9	SIMULATION AND MATH MODELS	1302	Dr. Jayant Ramakrishnan
10	INSTRUMENTATION AND SENSORS	1306	Dr. Sivaram Arepalli
11	ORBITAL MECHANICS AND AVIONICS	1311	Dr. John Sunkel
12	SPECIAL TOPICS II	1324	Tek Shrini
13	STRUCTURAL ANALYSIS	1313	Don Probe
14	MANAGEMENT II	1333	Dr. George Chandlee
15	AUTOMATION & ROBOTICS	1335	Dr. Zafar Taqvi
16	STRUCTURAL METHODS II	1326	Dr. Rakesh Bhargava

PLENARY SESSIONS: 3:50 - 4:50 BAYOU BLDG. ROOM 1313
RECEPTION: ATRIUM I COURTYARD



1994 AIAA TECHNICAL SYMPOSIUM

AUTHOR	TITLE OF PRESENTATION	SESSION	TIME
Carroll J. Spahn	A Prototype Ground-To-Air TV System	1	9:40
J. Gardner J. Barcio	Mission Evaluation Room Shuttle Support Data Handling	1	10:00
Shi Dingzhou	Ku Band Rain Attention Estimation For the Satellite Communications	1	10:20
Shian U. Hwu Ba P. Lu	Multipath Analysis for the Global Positioning System (GPS) Antenna in the Space Environment	1	10:40
Robert J. Panneton			
L. M. Rater	The Efficient Computation of GDOP & PDOP for a Four Channel GPS Receiver	1	11:00
Ba P. Lu Shian U. Hwu Robert J. Panneton Jacqueline A. Cook	S-Band Antenna Performance Prediction for International Space Station Alpha	1	11:20
Jack P. Brazzel, Jr.	Use of Laptop Computers Onboard the Shuttle during Rendezvous and Prox Ops	2	9:40
R. P. Singh R. Venugopal	Symbolic Equation Processing & Automated Code Generation	2	10:00
Bret McCleary	Real-Time GN&C Software Development Using MATRIXx	2	10:20
Tek Shrini	Software Life Cycle - A Review	2	10:40
Patrick Kane	Programming to Your Computers Cache/Bus Operational Characteristics	2	11:00
Kent Vinson	Electronic Cuff Checklist (ECC)	3	9:40



1994 AIAA TECHNICAL SYMPOSIUM

AUTHOR	TITLE OF PRESENTATION	SESSION	TIME
Gillian L. Y. Parker Steven A. Scheer	Secondary Debris Impact Damage and Environment Study	3	10:00
C. A. Jacobson, Jr.	Three Wall Meteoroid & Orbital Debris Shield Capability & Application to SSF Propulsion Module	3	10:20
Danny Nolan	Docking System Load Attenuator	3	10:40
Maureen Aragon Jonathan Lui	Berthing Latch Development for Space Station Assembly	3	11:00
Phil Mott	Safer (Simplified Aid for EVA Rescue)	3	11:20
Annappa A. Prabhu	Noise Reduction in Spacelab Hardware Using Isolators	3	11:40
Nelson Thompson	The Three P's of Engineering: Politics, Paper and Possibility	4	9:40
David S. F. Portree	A Survey of Mir Hardware Heritage	4	10:20
Tek Shrini	Sizing Study for Orbit on Demand Vehicles - A Review	4	10:40
Helen E. Dutton	Propulsive Effects of the Orbiter's Topping Flash Evaporator System	4	11:00
Dr. Zafar Taqvi	Development Trends in Biotechnology	4	11:20
Dr. C. L. Semar	Use of Rarefied Gas Dynamics in Plume Impingement Modeling	5	9:40
Howard S. Travis	The Use of Nonlinear Finite Element Techniques for the Structural Design of the Simplified Aid for EVA Rescue (Safer) Hardware	5	10:00
J. P. Smith	Bucky - A p-Finite Element Program for Plate Analysis	5	10:20



1994 AIAA TECHNICAL SYMPOSIUM

AUTHOR	TITLE OF PRESENTATION	SESSION	TIME
J. P. Smith	The p-Finite Element Method Applied to Plasticity Problems	5	10:40
V. Shivakumar	Adieux to the "Boundary Layer" Effect in the Boundary Element Method	5	11:00
A. Majed P. L. O'Reilly E. L. Copeland	Selection & Application of an Implicit A-Stable Numerical Time Solution to a Piece-Wise Linear, Coupled Dynamic System	5	11:20
Parviz Moayyad, Ph.D.	A Numerical Optimization Approach for Defining Structural Design Loads of a Large Robotic Manipulator Arm	5	11:40
Chris Burmeister	RCS Performance During RMS Operations: Orbiter Docking Port Change During 3A	6	9:40
Brian J. Scallan Keith E. Raterink Stanley T. Fernandes	The Design of Space Shuttle H-Infinity Load-Relief Controllers	6	10:00
S. T. Fernandes D. A. Pesek R. Ulrich	A Closed Loop Guidance for Launch Vehicles During Atmospheric Flight	6	10:20
T. P. Russell	Attitude Envelope Definition & Control Moment Gyroscope (CMG) Sizing for the International Space Station	6	10:40
Brian J. Scallan Keith E. Raterink Stanley T. Fernandes	Space Shuttle Ascent Equations of Motion: State Space Form	6	11:00
Kuk Whan Byun	Meta State Feedback in Station Attitude Control System Design	6	11:20
Jayant Ramakrishnan	Some Aspects of Control-Structure Optimization	6	11:40



1994 AIAA TECHNICAL SYMPOSIUM

AUTHOR	TITLE OF PRESENTATION	SESSION	TIME
Garland T. Bauch Dr. John L. Hunsucker	Integrated Risk Management (IRM) Survey	7	9:40
C. Andy Hailey	Aerospace Program Costs Reductions Through Early Detection of Design Flaws	7	10:00
C. Chullen P. K. Copeland A. E. Leighton L. G. Pepper B. L. Carroll D. E. Quintela	Financial Reporting for Efficient Contract Management	7	10:20
Rudolf M. Balciunas Cinda Chullen	Engineering, Test, & Analysis (ETA) Contract Performance Evaluation Process Enhancements	7	10:40
J. C. Schellhase J. L. Hunsucker	A Heuristic for the Placement of an Addition Processor in a Flow Shop with Multiple Processors	7	11:00
P. V. McDonald J. J. Bloomberg C. S. Layne	Lower Limb Coordination During Treadmill Locomotion Following Spaceflight	8	9:40
Graeme Jones C. S. Layne C. Pruettt P. V. McDonald J. J. Bloomberg	Measurement of Surface Electromyography & Limb Accelerations During Movements in Microgravity	8	10:00
C. S. Layne J. J. Bloomberg P. V. McDonald G. Jones C. J. Pruettt L. Merkle	Changes in Lower Limb Electromyographic Activity Following Spaceflight	8	10:20
Mark Reiff	Salyut Scientific Research Station: A New Paradigm in Commercial Manned Space Research	8	10:40



1994 AIAA TECHNICAL SYMPOSIUM

AUTHOR	TITLE OF PRESENTATION	SESSION	TIME
Paul Campbell James Whiteley	Habitability Characteristics of the Mir Space Station	8	11:00
G. O. Chandlee F. E. Mount	Development of a Space Flight Operations Incident Reporting Tool	8	11:00
Abhilash K. Pandya Michael E. Goldsby James C. Maida	Human Modeling in Virtual Environments	9	1:40
Doug Neal	Overview of the Advanced Simulation Development System	9	2:00
Gregory A. Clubb	The Automated Rendezvous & Capture Simulations (ARCSIM)- Rapid Prototyping in ADA	9	2:20
P. L. Fardelos Bernell McCormick et al	Spacecraft Engineering Simulation II (SES-II)- An Instance of the Advanced Simulation Development System (ASDS) Concept	9	2:40
Dr. Robert E. Pritchard	SES-II HAL Based Flight Software Sequential Simulation	9	3:00
Young W. Park Moises N. Montez	A Best Estimated Trajectory (BET) Method for GPS Users	9	3:20
David Strack	Optical Sensors for Proximity Operations on Shuttle (No Abstract)	10	1:40
Michael P. Cooke Todd Dutton	Microgravity Measuring Device (MMD)	10	2:00
K. B. Doane	Evaluation of State of the Art Wind Sensors for STS Winds Assessment	10	2:20



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AUTHOR	TITLE OF PRESENTATION	SESSION	TIME
L. V. Zyla	A Math Model for a Horizon Sensor	10	2:40
Sivaram Arepalli Vuong T. Pham James D. Milhoan Carl D. Scott	Progress in Flow Diagnostics for ARC Jet Facility	10	3:00
J. R. Carpenter S. F. Gomez C. L. Semar	Antenna Array Calibration in GPS Attitude Determination	10	3:20
Victor R. Bond Michael F. Fraietta Steven J. Sponaugle	A Modern Application of the Jacobian Integral Using a Special Perturbation Method	11	1:40
Steven J. Sponaugle Michael F. Fraietta Dr. Robert G. Gottlieb	Precise Interplanetary Targeting Using the Advanced Simulation Development System (ASDS)	11	2:00
Dr. Robert G. Gottlieb Michael F. Fraietta Steven J. Sponaugle	Targeting the Near Earth Asteroid Rendezvous (NEAR) Mission Using the Advanced Simulation Development System (ASDS)	11	2:20
Tom A. Mulder	An Advanced Approach to Optimizing Tomorrow's Rendezvous Trajectories	11	2:40
T. J. Crull S. F. Everett D. A. Pesek B. H. Rishikof L. A. Schmitt	Demonstrating Shuttle Avionics Re-Use for a Single Stage to Orbit (SSTO) Vehicle	11	3:00
Zhou Xianmin	A Short-Sequence Adaptive Filtering Algorithm	11	3:20
Kent Joosten	Lunar Exploration Renewal - Technologies for an Affordable Approach	12	1:40



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AUTHOR	TITLE OF PRESENTATION	SESSION	TIME
Javier E. Benavente	Advanced Gas Turbine Engine Component Health Monitoring with Neural Network Technologies	12	2:00
Rajan Naveen Dr. Deborah J. Fisher	A Methodology to Model the Design of a Geographic Information System (GIS) to Address Constructibility Issues	12	2:20
Javier E. Benavente	The Modeling & Analysis of Docking, Berthing & Deployment Dynamics	12	2:40
Arland L. Actkinson	ISO 9000 - What It Is and What It Means To You	12	3:00
James E. Oberg	Optimized Speaking & Writing for English-to-Russian Translation	12	3:20
R. O. Stearman	The Application of Higher Order Statistics in Subcritical Flutter Testing	13	1:40
Robert T. Suchnoiz Nancy Tengler	Space Shuttle Payload Bay On-orbit Flight Data Correlation	13	2:00
David C. Zimmerman Todd Simmermacher	Precision Modeling and Structural Health Monitoring	13	2:20
David C. Zimmerman Cinnamon Larson	Genetic Algorithm Techniques for Structural Dynamic Applications	13	2:40
Brian Zuchowski Stephen Solomon James Myers James Woods	The Space Shuttle Orbiter Payload Bay Door Kinematic/Dynamic Model	13	3:00
F. Yeh S. R. Mettu R. G. Forman	Stress Intensity Factors for Cracks from Holes in Cylinders	13	3:20
Michaela J. C. Masciarelli	Adult Education & Retraining in the Technical World	14	1:40



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AUTHOR	TITLE OF PRESENTATION	SESSION	TIME
T. A. Paxton	Quality & Efficiency Results From Teamwork	14	2:00
Steven R. Berry	International Aerospace Work Teams	14	2:20
Chris Burmeister	Working in the Austrian Space Industry	14	2:40
A. Monchak	Systematic Approach to Integrated Risk Management (IRM) For the International Space Station Alpha Program (ISSAP) Applied to the Study of Candidate Flight Experiments for the Shuttle/Mir Program	14	3:00
Dr. Nazareth S. Bedrossian	Fault-Tolerant Kinematic Control of Hyper-Redundant Manipulators	15	1:40
Pat Bevill David A. Read Brian Richard Ken Ruta Scott Teplitz	Robotic Assemble Feasibility for the International Space Station Alpha	15	2:00
Dr. Nazareth S. Bedrossian	How to Check for Robots Living in Flat Space	15	2:20
G. Ciangaru C. Riggs	Real Time Simulation of a Robotic Manipulator in Contact Constraints	15	2:40
M. Ahmadian D. McMahon R. Willett	A Computer Program for Calculating Three Axis Forces & Torques for a Seven Degree of Freedom Manipulator	15	3:00
Dr. Nazareth S. Bedrossian	A New Class of Transformation Preserving Hamilton's Equations	15	3:20
Chris Burmeister William Geissler	ACS Attitude Hold Performance During Proximity Operations	16	1:40



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AUTHOR	TITLE OF PRESENTATION	SESSION	TIME
J. Rebmann	Evaluation of Orbiter Backout Procedures from Space Station Freedom	16	2:00
Abdul Hye	Simulation Requirements for Space Station External System Active Thermal Control	16	2:20
John R. Keller	Lunar Radiator Shade Concepts for Advanced Thermal Control	16	2:40
Victor B. Lawrence	Developments in the NASA/JSC Fracture Mechanics Database	16	3:00
F. J. Monteleone	Design Concept for an Optical Connector Proposed as a Visual Aid	16	3:20



Revolutionary Concepts in Human/Computer Interaction

Presented by Stuart Card and William Buxton

Wednesday, May 18, 1994

9 am - 12 pm Pacific -
10 am - 1 pm Mountain -
12 noon - 3:00 pm Eastern Time

A Must See For:
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Software Engineers •
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UI Evaluators •
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Product Planners •



IEEE PRESENTS A 1994 VIDEOCONFERENCE

The standard style of user interface (windows-mouse-icon-pointing) has now run its course and is about to be supplanted by new paradigms of human-computer interaction, based on new advances in high performance graphics, displays, miniaturization, and networking. At the same time, there are new uses for computers and new classes of users, requiring new user interface paradigms.

The aim of this broadcast is to help engineers, engineering managers, and product planners systematically understand the changes and opportunities that are about to occur in user interfaces, now and in the future. Viewers will see examples of running experimental systems that embody some of the new thinking in human-machine design. These will be chosen to follow (1) the expansion in devices for communicating with users, (2) the expansion of the workplace idea into new metaphors and forms of augmented physical/electronic reality, and (3) the expansion of the use of computers enabled by interface advances. Finally, we will discuss what is known about the design and testing of advanced user interface concepts.

Benefits

From this course you will learn...

1. What comes after the aging windows-mouse-icon-pointing user interface paradigm — both the likely and the radical possibilities. What forces are shaping the new ways of interacting with computers.
2. New I/O devices that are changing the nature of human-computer communication and how they are being used.
3. How the workplace context of computation is being expanded into new types of augmented physical/electronic reality.
4. How design of interactive systems is shifting from user-centered to use-centered design.

Presenters:

Stuart Card, Manager, User Interface Research Group, Xerox Palo Alto Research Center

Mr. Card, a Xerox Research Fellow, has research interests centered around the theory and design of interactive computing systems. His current research is on the design and analysis of interactive 3D user interfaces for information access systems and on interfaces using computational paper. He was instrumental in the commercial introduction of the mouse, the development of Rooms multiple workspace window manager and has served on various National Research Council committees. He has developed the Information Visualizer, a system for information visualization retrieval and is co-author of the recent ACM SIGCHI curriculum for human-computer interaction



William Buxton, Associate Professor, University of Toronto

In addition to his professorial duties in the Department of Computer Science at the University of Toronto, Mr. Buxton is the Scientific Director of the Ontario Telepresence Project. He is also a consulting researcher at Xerox's Palo Alto Research Center where he is investigating new methods of input and interaction as well as multimedia and mediaspace techniques.



IEEE Videoconference
**Revolutionary Concepts
in Human/Computer
Interaction**

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