Newsletter of the IEEE Robotics & Automation Society

IEEE ROBOTICS AND AUTOMATION

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In This Issue

1990 IEEE INTERNATIONAL CONFERENCE ON

ROBOTICS AND AUTOMATION

Sponsored by the IEEE Robotics and Automation Society

General Chairperson: **R. A. Volz,** Texas A&M University
Program Chairperson: **A.J. Koivo,** Purdue University
Treasurer and Coordinator: **Harry Hayman**
Local Arrangements: **E.L. Hall,** University of Cincinnati

May 13-18, 1990
The Hyatt Regency Cincinnati
Cincinnati, Ohio

ADVANCE ANNOUNCEMENT
and
CALL FOR PAPERS

The theme of this conference is "Intelligent Automation and Robotics" with emphasis on information technology for sensor-based systems. Original basic and applied papers in all areas of automation and robotics are solicited. Special topics include but are not limited to the following:

- Automation systems: design, planning, modeling, evaluation, and optimization. Structural and geometric representation and reasoning.
- Flexible manufacturing systems: planning, scheduling, simulation and design for assembly.
- Artificial intelligence, knowledge management and expert systems for intelligent automation and robotics.
- Intelligent robot systems and their applications.
- Robot sensing: vision, touch, range, force. Information technology for sensors. Integration of multisensory information.
- Teleoperated and autonomous robots. Coordinated multiple robotic systems.
- Mobile robots: design, planning, navigation and applications.
- Micro electro-mechanical devices and systems.
- Applications of automation and robotics to industry, space, underwater, construction, medicine, hostile environment.

Submission of non-commercial papers from representatives of industry, universities, research institutions, and governme 's encouraged.

PAPER SUBMISSION: Four copies of papers should be sent by October 16, 1989 to:
A.J. Koivo, School of Electrical Engineering
Purdue University, West Lafayette, IN 47907

Reviews will be conducted by a program committee of established robotics researchers. Invited sessions will be entertained, but their papers will be reviewed by the normal process.
Authors will be notified of acceptance and furnished with an author's kit by January 15, 1990. Final papers received by the deadline will be included in the proceedings available at the conference.

The conference hosts workshops and tours on Sunday, May 13, and Friday, May 18, 1990, and tutorials on Monday, May 14. Conference sessions will be held on Tuesday, May 15 to Thursday, May 17, 1990. Prior to September 1, 1989 those with proposals for tutorials or workshops should contact: **Dr. J. Lin,** Department of Bioengineering, University of Illinois at Chicago, P.O. Box 4348, Chicago, IL 60680.

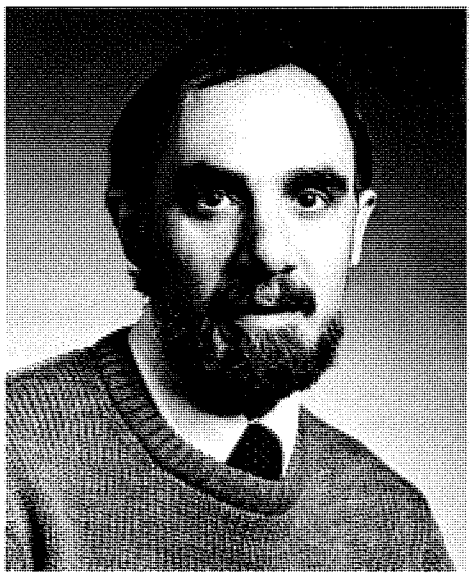
Announcing the Anton Philips Award for Best Student Paper

A $1000 prize will be awarded for the best paper offered by a graduate student. To be eligible, the student (1) must be first author and primary developer of the paper's ideas, (2) must have student status in June 1989 and (3) must be a member of the IEEE. Four copies of the paper, along with a nominating letter from the student's advisor and the student's IEEE membership number should be sent by October 16, 1989 to:

Anton Philips Award Committee
c/o A.J. Koivo, School of Electrical Engineering
Purdue University, West Lafayette, IN 47907

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.
IEEE

President's Message



Arthur C. Sanderson
Rensselaer Polytechnic Institute
President, IEEE Robotics & Automation Society

Whether we work in industry, government, or academia, it is increasingly apparent that the education and training of future generations of scientists and technicians is of vital concern both to those of us in technical fields and to society at large, because of the wide social and economic impact of the growth and strength of technology.

Many of us received our formal background in other disciplines and have been attracted by the challenges and opportunities offered in robotics and automation and its many areas of application. In fact, formal educational programs in robotics and automation are relatively recent. The beginning of the new academic year is an important time to consider these issues, and I believe the Robotics and Automation Society can have a role in facilitating the development of programs through the interchange of information and ideas and coordination of opportunities for active discussion of directions in the education and training fields.

I would like to encourage you to offer your comments and experience on education and training programs in robotics and automation through a contribution to the newsletter. In addition, I would like to encourage a forum for the discussion of the issues at our annual conference.

For example, at Rensselaer Polytechnic Institute, in addition to our programs at the undergraduate and graduate levels within the university, we have been developing a satellite broadcast series to industry, a cooperative program with community colleges, and an exciting initiative with the New York State Education Department for the development of curriculum modules in robotics and automation for high schools. We will try to share some more details on these programs in an article in a future newsletter.

In looking at many of the key issues of the day, from competitiveness in global manufacturing, to a renewal of initiatives in space exploration, the intellectual challenges and exciting applications offered by robotics and automation are apparent. It is clear that the core of these efforts relies on the attraction of new generations of enthusiastic minds into science and technology. We can contribute substantially to the success of these initiatives by our encouragement and participation in education and training programs.

The IEEE ESAP Project

Helping Engineers Make Career Decisions

Alan A. Desrochers
Rensselaer Polytechnic Institute
Chairman, R & A Education Committee

A workshop for education officers of the various IEEE Societies was held on June 24, 1989 in Pittsburgh, Pennsylvania. The purpose of the workshop was to update the society representatives on the current status of the Engineering Skills Assessment Program (ESAP). Dr. Stephen Kahne, chairman of the IEEE Engineering Skills Assessment Committee, presented an overview of the present program.

One major goal of the IEEE ESAP project is to help practicing engineers plan their careers in areas of fast moving technologies. With that in mind, the ESAP is aimed at our industrial members and should also prove to be useful for our student members in their early career decisions.

The Engineering Self Assessment Program has four components: the Field Specific Knowledge Inventory (FSKI), a self-assessment test, guidance information, and a management structure.

The FSKI is best explained by an example. Suppose you were considering a career in Robotic Assembly. First, you would consult the Robotic Assembly FSKI which would be three to five page profile of everything you need to know to work in this area. It would also tell you what Robotic Assembly Engineers actually do.

The FSKI will be prepared by a group of practicing engineers who currently work in the specific field and possess the required knowledge to do that job. It has been proposed to publish these FSKI's in the society newsletter or magazine.

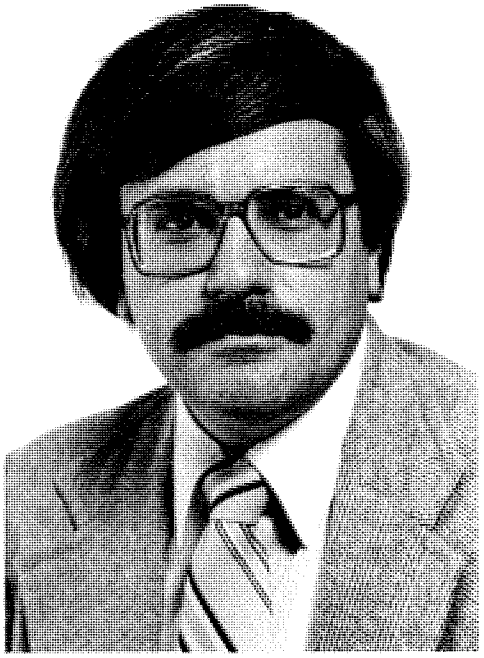
The second step in the ESAP process is to determine whether you have the required skills and background to work in the specific field. This is done through the self-assessment test, which is a multiple choice test prepared by a second group of experts in the field. The test would be published in the same society publication as the FSKI and the answers would be published in the next issue.

This program should provide a mechanism for the personal management of one's industrial career. Student members should be able to find out early in their studies exactly what engineers do.

Similarly the academic community could use the FSKI to keep them informed of real job needs.

Any members of the Robotics and Automation Society are invited to contact

Dr. Alan A. Desrochers
Center for Intelligent Robotic Systems for Space Exploration
CII 8015
Rensselaer Polytechnic Institute
Troy NY 12180-3590
(518)276-6718



Call for AdCom Nominations

George Lee, Purdue University
R & A Society Secretary

The IEEE Robotics and Automation Society currently has an 18-member Administrative Committee (AdCom) rotating on three-year terms. Beginning next year, we need to fill six vacant AdCom positions by election in early February. Professor Y.C. Ho, Chairman of the Nominating Committee, is working closely with Professor A.C. Sanderson, President of the Society, to come up with a slate of candidates for the six vacant AdCom positions.

I strongly urge anyone who is interested in the affairs of the society to volunteer himself/herself. There are two channels to obtain nomination for election to the AdCom. As stated in the Society Bylaws, anyone can be nominated with petitions signed by twenty-five (25) or more members of the R&A Society. These petitions must be received by Professor Ho (Harvard University, Pierce Hall, Room G121, 29 Oxford Street, Cambridge MA 02138) or me (School of Electrical Engineering, Purdue University, West Lafayette IN 47907) by October 15. It is also possible to be nominated by the Nominating Committee. Just send Professor Ho your updated short bio, resume, and your areas of expertise. Although the Nominating Committee may not be able to nominate everyone who volunteers to the AdCom, the Society has many appointed positions that may be able to use your talent and service.

R&A Standards Committee

Dr. Leonard S. Haynes
Intelligent Automation Inc.
Chairman, R&A Soc. Standards Committee

The Robotics and Automation Society Standards Committee is seeking interested members to participate in development of potential standards related to robotics and automation.

The IEEE, as a scientific, engineering, and educational society, develops and publishes standards in technical fields relevant to its member Societies. The IEEE Societies generally provide the sponsorship and technical details in support of the IEEE standards activities. The IEEE is an organizational member of the American National Standards Institute (ANSI) and also participates in the International Electrotechnical Commission through the U.S. National Committee. It is our objective that the Robotics and Automation Society's Standards Committee play an aggressive role in developing both ANSI and ISO standards related to robotics and automation.

Specific areas of interest include standards for static and dynamic performance measures, interface standards between layers of hierarchical control architectures, standardization of robot programming languages, and standardization of interfaces to sensors.

Prospective members should provide a personal resume, and information describing the interests of their company or organization with respect to robotics and automation. This information should be sent to:

Dr. Leonard S. Haynes
Intelligent Automation, Inc.
1715 Glastonberry Road
Rockville, MD 20854

Dr. Leonard S. Haynes is founder and president of Intelligent Automation, Inc. IAI specializes in Robotics and Artificial Intelligence, and is involved in contracts to produce practical systems for a variety of applications.

Before founding IAI Dr. Haynes worked for five years at the National Institute of Standards and Technology (formerly the National Bureau of Standards) where he was Leader of the Robotic Assembly Group and Acting Leader of the Real-time Control Systems Group within the Robot Systems Division.

Dr. Haynes is past chairman of the Robotic Industries Association Standards Committee for Information and Communication, and it was largely his initiative which began the effort to develop a companion standard to MMS (Manufacturing Message Service) for robots.

The US/French Cooperative Program in Ocean Systems Technology:

AUVs and Underwater Robotics

At an October 1987 workshop in Merrimack, New Hampshire and a follow-on meeting held in April 1988 in France, researchers from the two countries defined a set of research topics related to Autonomous Underwater Vehicles (**AUVs**) and Robotics, where mutual benefit to both the United States and France could result from cooperative efforts.

The participants established key research areas within the context of potential generic applications of AUVs in future ocean science and engineering programs such as:

- Deep ocean modeling
- Ocean bottom exploration and sampling
- Deep ocean work platforms
- Underwater surveys.

For decades the U.S. National Science Foundation (NSF) has been a financial supporter of ocean sciences under their Directorate for Geosciences. Support for ocean systems engineering, however, has been in the form of grants from sub-elements of the Engineering Directorates.

However, President Reagan's 1983 proclamation of the Exclusive Economic Zone (EEZ), which effectively extended the boundaries of the nation a distance of 200 miles (322 km) from the shorelines of the United States and all of its territories, together with the research interests of various segments of the U.S. ocean engineering community sparked NSF to focus a part of its interests directly at ocean engineering since it is a subject of importance from both a technical and a societal viewpoint.

The U. S. National Science Foundation's new initiative in ocean systems engineering, in parallel with the longstanding joint efforts under the U.S./French Cooperative Research Agreement of 1971, provided the basis for establishing a cooperative research effort between the U.S. and France in ocean systems technology. The specific areas of focus are

- Autonomous Vehicles and Robotics
- Marine Biotechnology
- Materials in the Ocean

Autonomous Underwater Vehicle Technology

The technology related to the development of untethered, unmanned submersibles has progressed to the point where such vehicles now offer a potential for significant improvements in ocean science and engineering applications. These submersibles, normally referred to as autonomous underwater vehicles or AUVs, can be used independently of existing manned or unmanned systems, or can be used as autonomous assistants to improve the efficiency of existing systems.

For the most part, the present research efforts into AUVs have been in the nature of feasibility studies, i.e., to see if it is possible to develop a certain capability, to expand a present capability such as power or speed, or to improve a capability such as memory, decision-making or positioning accuracy. From the point of view of autonomy or functioning independently without control by a human, present AUVs are severely restricted. Long range or regional transits are not possible since power is inadequate and the vehicle has no way to know when it has arrived at a destination or how to return to where it began. Its capability to identify objects and discriminate between objects is, at best, minimal, and its capability to perform a manipulative task is essentially nonexistent. Because of the severe obstacles presented by these and many other shortcomings it is obvious that development of a practical, versatile and reliable AUV can only be realized by further research and development.

The workshop participants decided to identify generic areas of needed R&D common to all regional and local AUV applications, irrespective of a specific application. Two different classes of vehicles were identified: a long range autonomous vehicle and a short duration, local area autonomous vehicle.

Long Range Autonomous Vehicle

A typical mission for a long range vehicle involves conducting a systematic survey. One example pertains to a bottom mapping survey in an area previously surveyed on a larger scale by a shipborne multibeam echosounder. On such a map, a typical area of 500 km^2 has been selected by geologists as of special interest.

Short Duration, Local Area Autonomous Vehicle

Typical mission goals are to conduct local search and observations in open water and to perform well-defined light tasks. A typical mission may last 5 to 6 hours, ship to ship. Observations can be acoustical (medium range

or turbid water) or optical (short range - clear water). Ranges of these missions are limited geographically to small areas, e.g., 100 meters square. It is assumed that the support ship transporting the AUV is located within a 500m radius around the vertical position of the target area. The AUV can then perform a number of tasks which are sequentially executed.

The workshop participants' recommendations of joint U.S./French cooperative research areas in AUV-related technology include the following:

- Positioning and navigation
- 3-Dimensional Image Sensing
- Autonomous manipulation
- Automated task planning
- Knowledge representation/acquisitions
- User interface with vehicle system
- Energy sources
- Sensors and sensor processing
- Communication
- Simulation/Emulation/Development Tools
- Reliability

The workshop was organized by **Dr. Richard Blidberg of the University of New Hampshire Marine Systems Engineering Laboratory** under the sponsorship of the U.S. National Science Foundation.

The Challenge of the Oceans

The future challenge will be to develop and use these smart machines to serve as extensions of mankind to ork in the marine environment from coastal waters to deep ocean basins, exploring, assessing, and developing the ocean's resources for the betterment of mankind.

With these words, presented at the October 1987 workshop of the US/France Cooperative Program in Ocean Systems Technology, Nam P. Suh, NSF Assistant Director for Engineering, charged the participants with the task of developing the technologies which will enable us to utilize the ocean and its resources.

However, as the researchers struggled to define and classify the numerous technical problems in underwater robotics, Dr. Suh reminded them of the other difficulties which must be faced:

1. The oceans, unlike space, are subject to political control. Nations have argued for centuries over control of the oceans. Furthermore, politics and economics have always been brothers, and fishing boats challenge the sovereignty of other nations as they hunt for their catch. Technology may help us to become herders rather than hunters in the ocean, and order may be secured out of the chaos.
2. A second reality that cannot be ignored is the military interest in the ocean. Historically, the oceans have been used for defense, and today highly sophisticated devices are in the ocean for purposes of surveillance, anti-submarine warfare, and other military uses. This is an important function that cannot be ignored as we develop an ocean engineering program.
3. The third constraint that must be considered is the impact on the environment. Let us learn from past mistakes that have destroyed our forests and rivers with no concern for future generations. Responsible leadership is required to maintain the ocean environment for the use of all peoples. Garbage dumped in one part of the ocean spreads and soils each of us.
4. The fourth constraint that will have a direct influence on planning the U.S./France program in ocean engineering relates to international competitiveness. The ocean represents a source of wealth, and as soon as the technology provides "return on investment", activity in the ocean will go into high gear.

Dr. Suh went on to discuss the roles of competition and cooperation in science and technology and their impact on the world, quoting President Kennedy's statement to the National Academy of Sciences that

> *...science is the most powerful means we have for the unification of knowledge, and a main obligation of its future must be to deal with problems which cut across boundaries, whether boundaries between the sciences, boundaries between nations, or boundaries between man's scientific and his humane concerns.*

R&A e-mail Addresses

This is the second installment of the Robotics & Automation e-mail/FAX directory. If you want to be included, send your "handles" to *wes@ecelet.ncsu.edu*. If you missed the first installment, send us a request (by e-mail, naturally!). We will publish additional entries as they come in as long as the number is manageable. Clip'n save!!

Name	Institution	e-mail	fax
Laeeque K. Daneshmend	McGill Univ.	laeeque@larry.mcrcim.mcgill.edu	
Peter Kovaks	Technische Univ. Berlin	kovacs@dbotui11.bitnet	
Pradeep Khosla	Carnegie-Mellon Univ.	pkk@fas.ri.cmu.edu	412-268-2860
Dinesh K. Pai	Cornell Univ.	pai@cs.cornell.edu	
Linda Shapiro	Univ. of Washington	shapiro@lillith.ee.washington.edu	
Sunil Singh	Dartmouth Univ.	sunil@northstar.dartmouth.edu	603-646-2384
Harry Stephano	George Mason Univ.	stephano@gmuvax2.gmu.edu	703-323-2630
Mohan Trivedi	Univ. Tenn. Knoxville	trivedi@vmsl.engr.utk.edu	615-974-5459

Calls for Papers

International Conference on Computer Integrated Manufacturing Rensselaer Polytechnic Institute, May 21-23, 1990. Papers are requested in the areas of System Integration, Technology Management, Product/Process Design, Control, and Communications. Submit 1500-word summary for peer review by December 1, 1989 to Prof. Alan Desrochers, Rensselaer Polytechnic Institute, Electrical, Computer, and Systems Engineering, Troy NY 12180-3590. (518)276-6718.

3rd National Conference on Robotics Melbourne, Australia, June 3-6, 1990. Papers are invited on all aspects of robotics. Send unpublished full papers to Dr. Kishor Dabke or Dr. Clive Berger, Dept. of Electrical & Computer Systems Engineering, Monash University (Melbourne), CLAYTON VIC 3168. email eln561x@monu1.oz.

ISRAM'90: 3rd International Symposium on Robotics and Manufacturing Vancouver, B.C. Canada, July 18-20. Regular and short papers will be accepted. Submissions in the area of robotics should be sent by November 1, 1989 to Prof. A.A. Goldenbert, Dept. Mechanical Engineering, Univ. of Toronto, Toronto Ontario M5S 1A4, Canada, Tel: (416)978-5745, Fax (416)978-7753. Submissions in the area of manufacturing should be sent by the same date to Prof. J.H. Mullins, Director of Manufacturing Engineering, College of Engineering, University of New Mexico, Albuquerque, NM 87131 USA, Tel: (505)277-3119, Fax: (505)277-0813. Five copies of the full-length manuscript (in English) for regular papers or 5 copies of an extended abstract for short papers are required.

1st International Conference on Automation Technology Taipei, Taiwan, ROC, July 4-6, 1990. Sponsored by the China Society of Industrial Automation & Automated Industries. Send 3 copies of a 300-word abstract by December 1, 1989 to Dr. Yung-Chun Wu, Conference Organizer, Professor of Control Engineering, National Chiao Tung University, Hsinchu, Taiwan, ROC. Tel: (035)712121, ext. 2301. FAX: (035)715544.

3rd Japan-USA Symposium on Flexible Automation Kyoto JAPAN. July 9-11, 1990.A Pacific Rim Conference, Sponsored by the Institute of Systems, Control, and Information Engineers and the American Society of Mechanical Engineers.Long papers will be reviewed on the basis of a complete manuscript and a 150 word abstract and short papers on the basis of an 800-word summaries. Four copies of the manuscripts or summaries should be submitted by November 30, 1989. Submissions from all countries except those from the U.S. and

Canada should be mailed to Prof. Tohru Watanabe, c/o The Institute of Systems, Control and Information Engineers, Kinki-chiho Hatsumei Center, Yoshido-Kawahara-Cho 14, Sakyo-ku, Kyoto 606, JAPAN. Submissions from the United States and Canada should be mailed to Prof. David A. Dornfeld, Dept. of Mechanical Engineering, University of California, Berkeley CA 94720 USA.

McGill University
Tenure-track Assistant Professor
Department of Mechanical Engineering

Applications are sought for a "Junior Chair" intended to complement the new NSERC Industrial Research Chair in Robotics held by Professor John M. Hollerbach. Support of this junior chair includes an NSERC Operating Grant, and the occupant will be expected to spend most of his/her time on research. A Ph.D in Mechanical Engineering is required, with specialization in Mechanical Design. Candidates should have demonstrated competence in the design and fabrication of electromechanical actuating and sensing systems, ideally for robotics or human movement studies, and an ability to formulate, realize and test advanced control strategies in mechanical design. An aptitude for collaborative work is essential. Applications should be sent to: Prof. A. Ahmed, Chairman, Department of Mechanical Engineering, McGill University, 817 Sherbrooke Street W, Montreal Quebec, H3A2k6. In the first instance, this offer is directed at Canadian citizens and landed immigrants in Canada.

Newsletter Deadlines

Issue	Deadline
December 1989	October 25
March 1990	February 5
June 1990	May 20
September 1990	August 1

Submissions by e-mail (wes@ecelet.ncsu.edu) are most appreciated by the editors.

ORMS

The publishers of *Operations Research/ Management Science (ORMS)* have announced that private subscriptions to the journal are now available at the rate of $40 per year. The institutional rate is $138 per year. ORMS contains literature digests, which are summaries of the major points of published articles, including results and formulae of the articles. Sample copies are available from the Executive Sciences Institute, 1005 Mississippi Ave., Davenport IA 52803.

IEEE USA HOT LINES

IEEE-USA Hot Lines is designed to provide IEEE Sections and Societies with up-to-date information on United States Activities.
IEEE publication editors who receive IEEE-USA Hot Lines can use entirely or excerpt from the contents.
We invite your comments on format, content, and lead time.
IEEE-USA Office, 1111 19th Street, N.W., Suite 608, Washington, DC 20036, USA, (202) 785-0017

Joseph A. Edminister, Editor—Catherine S. McGowan, Associate Editor

New Positions—The United States Activities Board approved the following IEEE-USA entity position statements at its August meeting in Pittsburgh:

- *National Medical Technology Institute* recommends establishing of a National Medical Technology Institute at the National Institutes of Health to promote the application of engineering and physical sciences to health research.
- *Federal Government Support for Technological Competitiveness* replaces IEEE-USA's 1983 position on a National Technology Foundation. The new position supplements IEEE-USA positions on Industrial Competitiveness and U.S. Engineering Research and Development.
- *Precollege Education in Mathematics, Science and Technology in the United States* calls for improvements in precollege math, science and technology education so that the United States will advance technologically and retain its leadership in scientific research and development.

Copies of the new positions are available from the IEEE-USA Office in Washington, D.C. The United States Activities Board withdrew a June 1983 position statement on a National Technology Foundation and a November 1984 position statement on Breeder Reactors in the United States.

New Brochure—IEEE-USA has released *How to Communicate With Members of Congress,* a brochure designed to help engineers make a difference in resolving issues affecting the profession by communicating their views to their Senators and Representatives. The brochure outlines who to contact; effective ways to voice your concerns; and when to use the different methods, which include meetings, mail, telegrams, and telephone calls. It also provides guidelines to help make your communications more effective.

Copies of this brochure are available from the IEEE-USA Office in Washington, D.C.

Electromagnetics—IEEE-USA Technology Activities Council Chairman William R. Tackaberry appeared recently on ABC television's "Good Morning America" to comment on recent press reports about the possible health effects of high-voltage transmission lines and other electromagnetic fields. "It's going to take time to get answers," Mr. Tackaberry said. "In the meantime, I don't see any real reason for people to overreact."

Mr. Tackaberry's comments supported IEEE-USA's recently approved position statement on "Biological Effects of Power-Frequency Electric and Magnetic Fields," which found insufficient information to define safe and unsafe field levels. "In general, there is not enough relevant scientific data to establish whether common exposure to power-frequency fields should be considered a health hazard," according to the position. It recommends that more research be conducted before safe limits of human exposure to these fields can be defined. Copies of the position are available from the IEEE-USA Office in Washington, D.C.

Defense Acquisition—USAB Chairman Edward C. Bertnolli attended a meeting with U.S. Secretary of Defense Dick Cheney and Assistant Secretary of Defense Donald Atwood in July to discuss the DoD Defense Management report Cheney submitted to President Bush. The report presents a plan to implement the Packard Commission recommendations, which would result in improved performance in the defens aquisition system. It would also provide for more effective management of the Department of Defense and our national defense resources.

The meeting indicated that Secretary Cheney is trying to build a broad constituency base for his plan by promoting an understanding of the plan's goals. Gloria Aukland, staff manager of IEEE-USA Communications, participated in a follow-up press briefing and question-and-answer session with Paul Stevens, Executive Assistant to Secretary Cheney. Stevens was the principal author of the report. This July 31 briefing brought together a small group of representatives of associations with a defense interest, as well as national military organization representatives.

Computer Viruses—John M. Richardson, Chairman of IEEE-USA's Committee on Communications and Information Policy (CCIP), sent a letter to Rep. Wally Herger (R-California) expressing interest in legislation "to reduce losses from harmful code in computing systems." Dr. Richardson's letter responded to Rep. Herger's invitation to IEEE to provide support for H.R. 55, the *Computer Virus Act of 1989.*

"IEEE-USA is not able to endorse H.R. 55 formally at this time," Richardson wrote, "but is happy to support your efforts toward the goals of the bill." He pointed out Committee observations for Rep. Herger's consideration. The so-called "viruses" that have attracted interest lately are only one of several types of computer code that can damage computer systems or databases. Others, he said, are known by such names as "worms" and "Trojan horses."

"We believe H.R. 55 is broad enough to cover harmful code other than that which is known as virus code," Richardson commented. "The bill is also clear in addressing harm to computer users. It may not be clear, however, that the provider of a computer facility should also be protected." He suggested that the bill be broadened to include providers of computer services as well as users.

IEEE-USA Office Move—On or about November 15, 1989, the IEEE United States Activities Office will relocate to 1828 L Street, N.W., Suite 1202, Washington, D.C., 20036-5104. The telephone numbers will remain the same: Office (202) 785-0017; Fax (202) 785-0835; and Information Line (202) 785-2180. Check with the office for the specific move date.

**** *THIRD AND FINAL CALL FOR PAPERS* ****

THIRD IEEE WORKSHOP
on
MICRO ELECTRO MECHANICAL SYSTEMS

An Investigation of Micro Structures, Sensors, Actuators, Machines and Robots

Sponsored by the IEEE Robotics and Automation Council
in Cooperation with the ASME Dynamic Systems and Control Division

12-14 February 1990
Napa Valley, California USA

SCOPE OF WORKSHOP

The IEEE Micro Electro Mechanical Systems (MEMS-90) Workshop embraces the design, fabrication, operation and application of devices, machines and systems constructed of millimeter-scale or smaller electromechanical elements. Within MEMS, electromagnetic fields can be generated or detected, and mechanical elements can be displaced or distorted in order to execute desired functions. Applications of MEMS are emerging in optics, fluids, chemical and biological processes, measurement and instrumentation, and robotics. Recent fabrication advances (such as micromachining sensor and actuator systems on silicon substrates) offer a myriad of new system possibilities. The Workshop seeks to bring together researchers in the many diverse fields impacting on the development of MEMS. Topics cover:

BASIC RESEARCH AREAS

* **Theory and Simulation** -- scaling, device physics, field and system modelling, and computation.
* **Design tools** -- CAD/CAM for 3D micro-fabrication.
* **Control** -- feedback, drivers, sensors, model-based.
* **Materials** -- metals, magnets, polymers, dielectrics, ferroelectrics, semiconductors, superconductors.
* **Fabrication Techniques** -- substrate and surface micromachining, Si-Si bonding, X-ray lithography, thin films, laser-assisted etching.
* **Assembly and Packaging** -- pre- and self-assembly.
* **Analytical tools** -- SEM, STM.
* **Experimental Evaluation** -- testing, calibration.

APPLICATION AREAS

* **Actuators** -- microactuators for small-scale machines; concatenated microactuators for large-scale machines.
* **Sensors** -- economical high performance sensors for the detection of strain, position, force, pressure, flow, acceleration, temperature, chemicals.
* **Optics** -- optical devices for the generation, modulation and detection of light.
* **Systems** -- MEMS embodying integrated microsensors and actuators.
* **Robotics** -- micro robots and teleoperators for uses ranging from industrial production to microsurgery.

DEADLINES FOR AUTHORS

29 September 1989: Initial Abstracts Due.
Prospective authors should submit a one-page abstract, with an additional page for figures, mailed in triplicate to:

IEEE MEMS-90 Workshop
c/o Preferred Meeting Management, Inc.
640 East Wilmington Ave.
Salt Lake City, UT 84106 USA
PHN: 801-466-3500 FAX: 801-466-9616

10 November 1989: Notification of Authors.
Acceptance letters and author kits will be sent by above date. Due to limited speaker slots, some papers may be accepted as poster presentations, but still given six pages in the digest.

1 December 1989: Late-News Papers Due.
Recent MEMS developments can be submitted as two-page abstracts for consideration as Late-News papers.

15 December 1989: Accepted Papers Due.
Accepted papers will be limited to six camera-ready pages (two pages for Late-News papers) in the digest, including figures.

WORKSHOP ENVIRONMENT

The MEMS-90 workshop will be held at the Silverado Country Club & Resort in the Napa Valley - about an hour drive from the San Francisco International Airport. In keeping with the format of the IEEE MRT Workshop (Hyannis, Massachusetts, 1987) and the IEEE MEMS-89 Workshop (Salt Lake City, Utah, 1989), no concurrent sessions will be held. Unscheduled time will be free for informal gatherings, or for tennis, golf, ballooning or horseback-riding, or for visits to the renowned Napa Valley wineries. Registration will be limited to 200 participants, with preference given to speakers.

REGISTRATION FEES

Registration fees on or before 12 January 1990:

IEEE Member	$240.00
Non-member	$300.00

Registration fees after 12 January 1990:

IEEE Member	$265.00
Non-member	$325.00

From the Editors' Desk

One of the highlights of the 1989 IEEE International Conference on Robotics and Automation last May was a special session on **Mobile Robot Research in Western Europe**. The session, which attracted over 140 participants, was held to present and discuss the preliminary findings of a 1988 study group sponsored by the National Science Foundation. Professor Lester Gerhardt of RPI, chairman of the study group, graciously prepared a report on the session for us.

We are also featuring a report on a 1987 Workshop on **Autonomous Underwater Vehicles and Robotics** which was conducted by the U.S./French Cooperative Program on Ocean Systems Technology, along with some thought-provoking remarks made at the workshops by Nam P. Suh, NSF Assistant Director of Engineering.

Thanks to Norman Caplan of the NSF, who sent us the workshop report.

A major function of a society newsletter like this one is to inform members of activities in the field outside their own specialties. own specialties. The newsletter can also provide a forum for debate on various political, social, and ethical issues which are inseparable from technological development. Therefore, we'd like to run similar articles on other meetings, as well as calendar announcement and calls for papers. Just send us one to three page articles. We will try to summarize longer reports.

The Robotics and Automation Society will soon be completing its first year as a full-fledged IEEE Society. In this issue, a call by Leonard Haynes for volunteers to work on the Standards Committee reflects the added responsibilities which we assume with our new status.

Alan Desrocher's report on the IEEE ESAP progr suggests some ways that society members can become personally involved in the education and training of tomorrow's professionals and in continuing education for those who are already working in the field.

We've got several additions to our R&A E-mail/FAX directory. We'll continue to run them in the newsletter unless the number of requests accelerates tremendously, in which case, we'll decide on some other medium.

This brings us to our parting shot. The *Newsletter* features news of the Society, which is generated by the members of the Society, so keep those e-mail messages, FAXes, and letters coming!

IEEE Robotics & Automation Society

ROBOTICS AND AUTOMATION

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