

\* Current engineering demand is showing a sharp downturn as evidenced by layoffs and as measured by High Technology Recruitment Index.<sup>3</sup>

\* Temporary demand peaks in certain specialty areas and in certain geographic areas should not be interpreted as representing a fundamental national demand for engineers.

\* Hiring of alien engineers should not serve individual corporate financial gain in place of the need and responsibility of maintaining our national engineering resource.

\* Those engineers and scientists newly choosing to practice within the United States should be afforded the same recognition and compensation as similarly qualified persons already practicing in the United States.

\* Foreign engineering students graduating from U.S. institutions should be strongly encouraged to return to their homelands to serve their countries' needs and should specifically not be afforded the opportunity to circumvent normal immigration routes as an outgrowth of the special privilege accorded them to study at U.S. institutions.

\* An excessive percentage of foreign graduate students in U.S. engineering schools is detrimental to the objective of developing the well qualified U.S. technical manpower resource. Foreign students often have language and cultural barriers which make their role as teaching assistants ineffective. This exacerbates the problem of developing technological literacy and research opportunities for the American student.

- Therefore, the IEEE/USAB specifically:
- \* Favors retention of controls and individual review of the entry of foreign engineers into the U.S. labor force.
  - \* Opposes legislation which would authorize the Secretary of Labor to "use labor market information without reference to the specific job opportunity and location for which certification is requested."
  - \* Opposes legislation which could permit the Secretary of Labor to waive requirements for a specific job offer "in cases of exceptional ability" due to the vague and uncertain nature of this rule.
  - \* Recommends that a guideline be established that provides for immediate denial of certification if the salary being offered the alien is below the 50th percentile for that being paid for similar positions.
  - \* Supports a return rule for all foreign students, effective immediately with no exemptions, in federal legislation, which would require them to leave the U.S. for two years before they adjust their immigration status to seek entry into the United States.
  - \* Proposes that if exemptions are allowed despite IEEE/USAB objections, they should be limited to the shortest possible time period; and the exemption criteria should include a **graduate** degree from a properly accredited institution in a field of engineering and a salary comparable to U.S. citizen colleagues.
  - \* Recommends that private and government programs be developed to facilitate increasing the percentage of American students in U.S. graduate engineering schools.

REFERENCES:

- (1) American Electronics Association. **Technical Employment Projections Survey; 1981, 1983, 1985.** Palo Alto, CA; May 1981.
- (2) College Placement Council, Inc. **CPC Salary Survey.** Bethlehem, PA; March, 1983 (Formal Report No. 2).
- (3) Deutsch, Shea & Evans, Inc. "High Technology Recruitment Index." New York, N.Y.; March, 1983.

ENGINEERING STUDENT ENROLLMENTS, FALL 1981			
Year In School	All Eng. Students	Foreign Eng. Students	% Foreign
Total Full Time Undergraduates	387,577	25,367	7%
Freshmen	115,280	4,974	4%
Sophmore	87,519	5,611	6%
Junior	86,633	6,831	8%
Senior	92,414	7,537	8%
5th Year	5,731	414	7%
Total Part Time Undergraduates	32,825	1,218	4%
Total Full Time Masters (Includes Engineering Professional Degrees)	32,300	11,109	34%
Total Full Time Doctorate	15,472	6,876	44%
Total Part Time Masters & Doctorate	29,818	2,577	9%

*SOURCE: "Engineering And Technology Enrollments, Fall 1981." Part 1, Engineering. Engineering Manpower Commission of the American Association of Engineering Societies, Inc., New York, 1982.*

SPONSORSHIP OF FOREIGN STUDENTS			
	Public Institutions	Institutions	Average
Student's Home Government	14.2%	11.8%	13.4%
Foreign Private Sponsor	2.4%	3.4	2.7
U.S. Government	2.3	2.2	2.3
U.S. Private Sponsor	1.3	2.0	1.5
U.S. College or Universities	8.7	10.7	9.4
Self or Family	66.9	66.9	66.9
Employer	2.0	1.6	1.9
Other	2.2	1.4	1.9

*SOURCE: OPEN DOORS 1981-1982. Institute for International Education, New York (to be published in 1983).*

ENGINEERING DEGREES GRANTED, SPRING 1982			
	Total	Foreign Nationals	%Foreign
Bachelor	66,990	5,410	8%
Masters	18,289	5,216	29%
Professional Engineering	254	68	27%
Doctorate	2,887	1,167	40%

*SOURCE: "Engineering and Technology Degrees 1982." Parts 1 & 2 Engineering Manpower Commission of the AAES.*

PLACEMENT OF ENGINEERING GRADUATES, 1982			
(% indicates no job offers or plans at graduation)			
Bachelors	— 14%	Masters	— 7%
		Doctorate	— 6%

*SOURCE: "The Placement of Engineering and Technical Graduates 1982," Engineering Manpower Commission of the AAES.*



The IEEE

# Newsletter

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It is not necessary to inform the North Jersey Section when you change your mailing address. The NEWSLETTER and other section mailings use a list provided by IEEE's national headquarters in New York. This means the Section has no need to maintain a mailing list or addressing plates. Section membership records are changed when Headquarters notifies us.

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### MTT/AP Meeting Set

The first MTT/AP Chapter meeting of the season will be held September 12th at Rutgers University. Dr. George Matthaehi will present a talk to the combined chapters from the Princeton, Jersey Coast and North Jersey Sections. Title of Dr. Matthaehi talk is "Dielectric Waveguide Filter Techniques In Millimeter Waves."

Dr. Matthaehi is one of the foremost personages in the microwave filter field and his talk covers a topic of great current interest. His presentation will cover one hour, which will leave plenty of time for questions.

**Time:** 8 PM, Monday, September 12, 1983.  
**Place:** Rutgers University, Busch Campus, Hill Center, Rm. 114, Piscataway, N.J.  
**Additional Information:** Richard Snyder (201) 492-1207 or Hy Goldman (201) 284-3739.

### PACE Sets Meeting Dates

The North Jersey Section Professional Activities Committee will sponsor its regular monthly meeting the third Wednesday of every month. Meetings will be held from 7:30 PM to 9:30 PM at Singer-Kearfott, Plant 3, 1250 McBride Avenue, Little Falls, N.J.

These meetings are open to all members and interested public professionals with refreshments free of charge.

**Further Information:** M. McLarin (201) 335-6847; H. Waters, (201) 785-6417.

### 3-D Shape Recognition

"Global 3-D Shape Recognition" is the title of a presentation to be made by Dr. Frank P. Kuhl at the September 14 meeting of the NJ Chapter of the Systems Man & Cybernetics Society.

**About The Talk**

This talk concerns the identification of three-dimensional rigid objects when viewed by a two-dimensional imaging system. The images are obtained from digitized TV video data. Several straight-forward image enhancement procedures are used to remove noise and exaggerate edges and the resulting edge contours are then chain encoded. Once the contour of an object, perhaps an airplane, has been extracted, a normalized Fourier descriptor is calculated and is compared to a library of views of various airplanes.

A new method of storing the library data and making classifications has been developed that represents a differential encoding of the descriptors, which may require less storage while simultaneously increasing classification speed and accuracy. Simulations of the system for aircraft have yielded promising results in both recognition accuracy and attitude determinations.

**About The Speaker**

Dr. Frank P. Kuhl received his BS and MS Degrees from Columbia University, N.Y. in 1957 and 1958, respectively, and the Dr. Eng. Degree from Yale University in 1963. His primary interest is in pattern recognition in the areas of polarized, radar-backscatter classification of arbitrary targets in free space and also image processing of alphanumeric characters and raster-scanned pictures. *Cont. on page 2*

He has done this work mostly at Raytheon Corporation Bedford, Mass. (1963-1965) and Union College, Schenectady, N.Y. (1965-1967) and the U.S. Naval Academy, Annapolis, MD (1968-1973). He has also worked at Singer Kearfott, Wayne, N.J. (1974-1977) and ITT, Nutley, N.J. (1977-1978) where he created and simulated Kalman Filters for TACAN and other navigational aids.

Dr. Kuhl is currently employed by the U.S. Army at ARRADCOM, Dover, N.J. where he is working on automated target recognition and trajectory estimation.

**Time:** 7:30 PM, Wednesday, September 14, 1983.  
**Place:** ITT Auditorium, 500 Washington Ave., Nutley, N.J.  
**Additional Information:** Dr. Allen Gorin (201) 757-1600, X-2472; Dr. Ben Ashjari (201) 420-5614.

### Obtaining Defense Services Contracts

“How to Obtain Department of Defense Engineering Services Contracts” is the subject of the first meeting of the 1983-1984 year by the Metropolitan Chapter of the Engineering Management Society. Speaker for the meeting will be Philip I. Johnson of Ft. Monmouth.

**About The Talk**

Initially, the address presents an overview of DOD contracting for engineering services, the mechanisms of contracting, and the special emphasis placed by DOD on small business programs.

The body of the address deals with the techniques of actually obtaining contracts. Major emphasis is placed on how to work with the DOD, recognize and develop business possibilities, and then prepare winning proposals. Technical, management, personnel, and cost factors are considered.

Concluding remarks deal with how to work with the DOD once you have won the contract.

**About The Speaker**

Philip I. Johnson is a senior management official in the Army Communications Electronics Command at Fort Monmouth, New Jersey. He is Chief of the Technical Support and Management Office; and manages engineering contracts amounting to many millions of dollars.

Prior to coming to Fort Monmouth, Mr. Johnson was an engineer in a select research and development group on the staff of the

Secretary of Defense. In this capacity he was the inventor of highly classified electronic systems used to protect the life of the President of the United States. Immediately before joining the Department of Defense, he was head of the Computer Center at Illinois Institute of Technology.

Mr. Johnson’s background includes engineering management positions with the General Electric Company, Hughes Aircraft, and RCA. While with General Electric he developed a number of the basic concepts of the NATO air defense system in Western Europe.

Mr. Johnson holds a degree in electrical

engineering from the University of Minnesota. His most recent graduate work is in computer science at Princeton University. He has done graduate work at Oslo University and American University.

**Time:** 7:30 PM, Wednesday, September 21, 1983.  
**Place:** Willkie Memorial Building, 20 West 40th St., NYC.  
**Pre-Meeting Dinner:** 6 PM, Swiss Bear Restaurant, 20 East 41st St., NYC.  
**Additional Information:** Martin Izaak (212) 397-7438, Barry Gourary (201) 783-5570, and John Van Savage (201) 544-2334.

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### Scene Labeling In Computer Vision

The second meeting of the Systems, Man & Cybernetics Chapter will be held on Thursday, October 13, 1983. Dr. Robert A. Hummel of the Courant Institute will speak on “Scene Labeling in Computer Vision ”. **About The Talk**

Computers and robots can use vision to access information about the environment and to aid in making decisions. By processing digitized images, objects can be recognized and labeled according to their interpretation. How should knowledge be represented and learned by a computer vision system? In this talk, a local parallel iterative scheme, called relaxation labeling, will be presented. Using examples, it will be shown that relaxation labeling can be used to reduce ambiguity and achieve consistency in scene labeling.

**About The Speaker**

Robert A. Hummel (M’82) received the B.A. degree in mathematics from the University of Chicago and the Ph.D. degree in mathematics from the University of Minnesota. While in school, he spent summers at the Picture Processing Lab of the Computer Science Center at the University of Maryland. He has also been employed at Stanford Research Institute and the Signal and Image Processing section of Honeywell’s Systems and Research Center in Minneapolis, Minnesota.

From 1980 to 1982 he was a Courant Institute Instructor in the mathematics department of New York University’s Courant Institute of Mathematical Sciences. He is currently an Assistant Professor of Computer Science in the Courant Institute, and a member of the Robotics and Vision Research Section there. He also serves as a consultant to Martin Marietta Aerospace in Orlando, and is an adjunct faculty mem-

ber of IBM’s System Research Institute in New York.

In mathematics, Dr. Hummel’s research interests include variational methods for the study of partial differential equations, fluid mechanics, and foundations of thermodynamics.

In computer vision, Dr. Hummel is known as one of the co-developers of relaxation labeling methods for scene analysis. He has also worked in image enhancement, image representation and feature operator design.

**Time:** 7:30 PM, Thursday, October 13, 1983.  
**Place:** ITT Auditorium, 500 Washington Avenue, Nutley, NJ.  
**Pre-Meeting Dinner:** 5:30 PM, Jade Fountain Restaurant, Clifton, NJ.  
**Additional Information:** Ben Ashjari (201) 420-5614, Allen Gorin (201) 757-1600, Andrew Meyer (201) 645-5468 and Ed Van Winkle (201) 939-8304.

## PACE NEWS

Professional  
Activities  
Committee for  
Engineers

By R. Tax

A position statement entitled “Alien Engineers, Foreign Students, and Our National Engineering Resource” was prepared earlier this year and unanimously approved by members of the Manpower Task Force (MTF) on April 29, 1983. This same MTF position statement was approved by IEEE’s United States Activities Board (USAB) on June 8, 1983.

The IEEE’s Executive Committee under the hand of Charles Eldon opposes the MTF and USAB position stating....“it is neither prudent nor appropriate for IEEE to take a public position contrary to that of the U.S. Government, electronics industry, engineering schools, taxpayers--and a great many members of IEEE.” He proposed that the USAB Manpower Committee position be rejected and be replaced by his proposal.

Apparently one goal of the Executive Committee was to get USAB and the MTF to revise their statement. The Task Force met in Washington USAB office to resolve the issue (7/9/83). Of prime concern is the “Return Home Provision” for foreign students. The Manpower Task Force responded with the following:

“The Manpower Task Force shares the concern of the IEEE

Executive Committee regarding criteria for permitting foreign students to remain in the U.S. after graduation.

After many agonizing reviews over the past several years, the Manpower Task Force has reluctantly concluded that the establishment and enforcement of criteria for exemptions from the two-year return rule for foreign students is impractical and largely unworkable.

It is precisely because of these practical difficulties that the Task Force has taken the position of opposing all such exemptions.”

The USAB’s Manpower Task Force approved position statement is presented in this issue. More information is covered in the July issue of *The Institute*. See page 5, “Board Considers...” and page 3, “Commentary.”

### Position Statement On Alien Engineers & Foreign Students

Whereas the IEEE/USAB:  
Encourages that all engineers and scientists, without regard to race, creed, or national origin, be afforded the highest level of opportunity to practice their profession commensurate with their individual qualifications; and finds that:

- \* Engineering manpower must be viewed as a critical national resource in which there is a large investment and which should be efficiently maintained and utilized. Retraining programs, continuing education and adequate use of support facilities, including personnel and paratechnicals, are examples of such maintenance of investment in human capital and its efficient utilization.
- \* Engineering employment has a cyclic history, which may be directly linked to the state of national and international economy and is exacerbated by fluctuations in defense spending and government R&D expenditures.
- \* Claims of a critical shortage of engineers, are exaggerated<sup>1</sup> and are not substantiated by hiring or salary patterns.<sup>2</sup>