The IEEE Newsletter

PUBLICATION OF THE NORTH JERSEY SECTION OF THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS

Vehicular Technology Soc.:

FORTRAN 90 Applications

On September 19, 1995, the IEEE North Jersey Vehicular Technology Society will present a talk on "Fortran 90 Applications." The speaker will be Dr. William Schick.

About The Talk

Dr. Schick will discuss Fortran 90, the successor to Fortran 77; how it is improved over the earlier language and how that makes it more suitable for certain engineering applications. The new language features include: Modules (collections of data, constants, and procedure statements), in line comments, the CASE construct for selecting options, derived data types, and matrix multiplication (via an intrinsic function), and more. Application to filter design, simulation in the context of product testing and model testing, Fourier transforms, analog and digital signals, and generating a sampled data signal will be described.

About The Speaker

Dr. Schick is Professor Emeritus, Fairleigh Dickinson University, Teaneck, N.J. His industrial experience started at United Transformer Company in 1944, and after several years each at Sperry Gyroscope, Todd Products, and NJ Electronics, he started his academic career at FDU in 1957. He became head of the Department of Electrical Engineering in 1964, and Asst. Dean of Academic Computing in 1987. His publications include "Fortran for Engineering" (McGraw Hill) and "Fortran 90 and Engineering Computation" (John Wiley). Dr. Schick is a member of the IEEE, Sigma Xi, and the N.Y. Academy of Sciences.

All Welcome

You need not be a member of the IEEE to attend, and there is no charge for admission. Light refreshments will be served. One copy of Dr. Schick's book "Fortran 90 and Engineering Computation" will be given as a door prize.

Time: 7:30 PM, Tuesday, Sept. 19, 1995.
Place: Fairleigh Dickinson University, Teaneck Campus, Rm. M207, Muscarelle Bldg., River Road at Route 4.
Information: Mel Lewis (914) 968-2500, ext. 2304; Art Greenberg (201) 492-1207.

North Jersey PES/IAS:

Talk On Geothermal Heat Pumps

On September 21, 1995, the North Jersey Power Engineering/Industrial Application Society Chapters will present a talk on "Geothermal Heat Pumps." The speaker will be Frank J. Mescall, an associate at Paulus, Sokolowski and Sartor, Inc., a consulting engineering firm in Warren, N.J.

About The Talk

Installation and application of energy efficient geothermal heat pumps are playing an increasing role in supplying heating and air conditioning requirements in new buildings. Mr. Mescall will describe the energy savings realized with the recent installation of a 1,300 ton HVAC system installed at an educational institution incorporating a geothermal heat pump.

Information will also be available at the meeting concerning geothermal energy applications for new residential homes.

Time: 7:00 PM, Thursday, September 21, 1995.
Place: Jersey Central Power & Light Co., 300 Madison Ave., Morristown, N.J.
Information: Ken Oexle (JCP&L) (201) 455-8481.

North Jersey Section PACE:

Talk On Asset Diversification

At the September 14, 1995 meeting of the North Jersey Section's Professional Activities Committee for Engineers, speaker Edward Landau will guide meeting participants through the definition of investment risk, the steps in asset diversification and case studies to show how strategies work to minimize the risk of investing.

About The Speaker

Edward Landau is a Personal Financial Advisor with American Express. As a financial advisor, he is licensed by the National Association of Securities Dealers. He specializes in personal financial planning, including retirement and investment planning. Before becoming a financial advisor, Mr. Landau spent over twenty years as an RF Design Engineer, Consultant and Engineering Manager.

Time: 7:30 PM, Thursday, September 14, 1995.
Place: JCP&L Co., 300 Madison Avenue and Punch Bowl Road, Morristown, N.J.
Information:
Robert Sinusas (201) 228-3941.

SEPTEMBER, 1995

No. Jersey-Control Sys. Soc.:
Robust Near Time-Optimal Control Of Flexible Structures

The September 26, 1995 meeting of the North Jersey Section IEEE Control Systems Society will feature a talk on "Robust Near Time-Optimal Control Of Flexible Structures." The speaker will be Lucy Y. Pao, currently Assistant Professor in the Electrical Engineering and Computer Engineering Department, University of Colorado at Boulder.

About The Talk

For speed and fuel-efficiency purposes, lightweight flexible materials are used in the construction of many systems. The control of such flexible structures, however, is a difficult problem and is currently an active research area. Methods that have been investigated for controlling flexible structures can be roughly divided into two categories: feedback and feedforward approaches. While feedback techniques have demonstrated good control of flexible structures, the complexity of these feedback methods can often be significantly decreased by using a feedforward controller that alters the actuator commands to reduce the residual system oscillations.

This talk will outline several feedforward approaches for controlling flexible systems to achieve rapid maneuvers. One method, time-optimal control, seeks to use the maximum torque available to attain the fastest maneuvers given actuator limit constraints. We will discuss both time-optimal control and a more general feedforward technique known as input shaping that can be made robust to system parameter uncertainty. We will outline several input shaping methods and compare them with respect to their insensitivity to modeling errors, time-optimality, and amount of vibration caused *during* maneuvers.

About The Speaker

Lucy Y. Pao received the BS, MS and PhD., degrees in Electrical Engineering from Stanford University, Stanford, CA in 1987, 1988, and 1991, respectively. She was a Hughes Aircraft Company Master's Fellow from 1987-88 and a National Science Foundation Graduate Fellow from 1988-91.

From 1983-1988, Dr. Pao spent periods of time working at the Naval Surface Warfare Center (Silver Spring, MD), Pacific Gas & Electric Co., (Holmdel, NJ). From 1991-1993, she worked in the Signal Processing Department at The MITRE Corporation in Bedford, MA. From 1993-1995, she was an Assistant Professor in the Electrical Engineering and Computer Science Department at Northwestern University in Evanston, IL. Her interests are in the control of flexible structures, nonlinear filtering and multisensor data fusion, and dextrous robotics.

All Welcome

Members and guests interested in the meeting topic are invited.

Time: 6:30 PM, Tuesday, September 26, 1995.
Place: John Howard Room, Hazell Ctr., NJIT, 323 Dr. Martin Luther King, Jr. Blvd., Newark, N.J.
Information: Tim Chang (201) 596-3519 or tnc0766@tesla.njit.edu.

NJ Communications Soc:
Evaluating An ATM Local Computer Network

On September 27, 1995, the IEEE North Jersey Communications Society together with NJIT's Center for Communications and Signal Processing will present a talk on "Performance Evaluation Of An ATM Local Computer Network." The speaker at this meeting will be Nadar Mir (Mirfakjraei).

About The Talk

In this talk the performance of a local switching network using a Manhattan street network (MSN) for high-speed ATM applications is evaluated. The MSN has a cyclic structure and belongs to the class of deflection-routing networks. The use of shared buffering in the structure of each node is proposed. With shared buffers the network operates efficiently since the occurrence of deflections is minimized. A new analytical model for the MSN is developed and used to study the traffic performance of this network. The key new result of this study is the need to scale the bandwidth of the MSN links in proportion to the network size. Through this evaluation, can be determined how much speed advantage an MSN requires to become a practical switch. Numerical results of the analysis are compared with numerical results of an extensive simulation developed for this network.

About The Speaker

Nader Mir (Mirfakhraei) received the BSc degree (with honors) in electrical engineering in 1985. He also received the MSc and PhD degrees both in electrical engineering from Washington University in St. Louis in 1990 and 1994, respectively. He is currently a research associate professor at Advanced Telecommunications Institute, Stevens Institute of Technology, New Jersey.

Time: 7:00 PM, Wednesday, September 27, 1995. Pizza and Pop, 6:45 PM.
Place: NJIT, 202 ECE Center, Newark.
Information: N. Ansari (201) 596-3670.

NJ Computer Chapter:
Object Orientation, Virtual Or Reality?

On September 19, 1995, the IEEE North Jersey Computer Chapter will present a talk on "Object Orientation, Is it Virtual Or Reality." The speaker will be Dr. Edward R. Byrne.

About The Talk

The digital computer is quite unusual among inventions in that it does not perform any specific function. It does not plow a field or fly or whatever. Instead, it does some unspecified task that software instructs it to do. This has led to a variety of ways to view the computer over the years.

This talk will review the ways in which we have perceived computer software in the past and will then concentrate on describing Object Orientation, where it came from, what is real about it, what is just the frosting, where it might be going, and as the saying goes, "Where's the beef?"

While not strictly new, object orientation is now popular and as is always the case with computing trends, is being promoted without limit.

About The Speaker

Dr. Edward R. Byrne has had an extensive career with AT&T Bell Labs and Bellcore in software development. Currently, he is a full time consultant in his own firm, Flatland Computer Specialities, Inc., where he does teaching and consulting in the fields of software development practices and programming. For the past two years, he has been teaching C and C++ courses sponsored by the IEEE North Jersey Section.

He is a member of the executive committee of the IEEE North Jersey Section and Membership Chairman of the Northern New Jersey Consultants Forum which is associated with the IEEE North Jersey Section. He is a Senior Member of the IEEE and serves on the IEEE Software Engineering Standards Committee.

Dr. Byrne received his BS and MS in Electrical Engineering from Notre Dame University and his PhD in Systems Science from Polytechnic Institute of New York.

All Welcome

You do not need to be an IEEE member to attend. Please bring your friends.

Time: 7:30 PM, Tuesday, September 19, 1995.

Place: JCP&L, Punch Bowl Room, Morristown, N.J.

Information/Pre-Meeting Dinner: Howard Leach (201) 540-1283 (H), or (908) 906-0400 (W).

North Jersey Section Activities
September

September 6—"North Jersey Section Executive Committee Meeting"—7:00 PM, Plant 11, GEC-Marconi, 164 Totowa Road Totowa, N.J. Dr. Fred Chichester (201) 744-7340.

Sept. 14—"Asset Diversification: Strategies For Investing"—North Jersey Section PACE, 7:30 PM, JCP&L Co., 300 Madison Avenue & Punch Bowl Road, Morristown, N.J. Robert Sinusas (201) 228-3941.

Sept. 19—"FORTRAN 90 Applications"—IEEE North Jersey Vehicular Technology Society, 7:30 PM, Fairleigh Dickinson University, Room M207, Muscarelle Bldg., River Road at Route 4, Teaneck Campus. Mel Lewis (914) 968-2500, ext. 2304.

Sept. 19—"Object Orientation, Is It Virtual Or Reality?"—North Jersey Computer Chapter, 7:30 PM, JCP&L, Punch Bowl Room, Morristown, N.J. Howard Leach (908) 906-0400 (W).

Sept. 20—"RF Components For Wireless Communication"—IEEE North Jersey Section MTT/AP Chapter, 7:00 PM, NJIT ECE C202, 2nd Floor Conference Room, (corner of Warren and Summer Sts., Newark, N.J.). Chandra Gupta (201) 633-4469 (GEC-Marconi).

Sept. 21—"Geothermal Heat Pumps And HVAC Systems"—North Jersey PES/IAS, 7:00 PM, JCP&L Co., 300 Madison Avenue, Morristown, N.J. Ken Oexle (JCP&L) (201) 455-8481.

Sept. 26—"Robust Near Time-Optimal Control Of Flexible Structures"—North Jersey Control System Society Chapter, 6:30 PM, John Howard Rm., Hazel Center, NJIT, Newark, N.J. Prof. Timothy Chang (201) 596-3519.

Sept. 26-Dec. 5—"Seminar: Object-Oriented C++ Programming"—IEEE North Jersey Section, JCP&L Co., 300 Madison Ave., Morristown, N.J. John Baka (201) 455-8534.

Sept. 27—"1-Day Seminar: Harmonics And Power Quality in Electrical Distribution Systems"—IEEE North Jersey Section PES/IAS, 8:30 AM-3:30 PM, JCP&L, 300 Madison Ave., Morristown, N.J. D. McFadden (212) 239-8510.

Sept. 27—"Performance Evaluation Of An ATM Local Computer Network"—IEEE North Jersey Communications Society & NJIT's Center for Communications and Signal Processing, 7:00 PM, NJIT, 202 ECE Center, Newark, N.J. N. Ansari (201) 596-3670.

Sept. 27-Nov. 29—"Seminar: C++ For Windows"—IEEE North Jersey Section, JCP&L Co., 300 Madison Ave., Morristown, N.J. John Baka (201) 455-8534.

Sept. 28—"Avoiding 20 Questions And The IRS Section 1706"—IEEE Consultants' Network of Northern NJ, 7:30 PM, AT&T Bell Labs, 67 Whippany Rd., Whippany, N.J. Robert Walker (201) 736-0771.

Upcoming Meetings

Oct. 4—"North Jersey Section Executive Committee Meeting"—7:00 PM, Plant 11, GEC-Marconi, 164 Totowa Road Totowa, N.J. Dr. Fred Chichester (201) 744-7340.

Oct. 18—"Microwave CAD, Including EM Optimization And Modeling Of Arbitrary Geometries"—IEEE North Jersey Section MTT/AP Chapter, NJIT, Newark, N.J. (Watch for details next issue.) Chandra Gupta (201) 633-4469.

Oct. 19—"Scientific Study of Mind/Matter Interactions—Princeton Engineering Anomalies Research"—Metropolitan Section Engineering in Medicine and Biology Society, 7:30 PM, Rockefeller Univ., Rm. 305 Weiss, 1200 York Ave., NYC. Joel Levitt (718) 891-6460.

Oct. 21—"One-Day Seminar: Recent Trends In Adaptive Filtering"—IEEE Philadelphia Section Signal Processing Chapter, University of Pennsylvania, Phila., PA. For information call Prof. Moeness Amin (610) 519-7305.

Oct. 25—"Seminar: Getting The Most Out Of Your Electric Power System"—North Jersey Section IAS & PES Chapters, 9:00 AM - 3:00 PM, JCP&L Hq., 300 Madison Ave., Morristown, N.J. Vittal Rebbapragada (201) 804-2011.

Nov. 16—"Flywheel Energy Storage In Electric Utility Applications"—North Jersey PES/IAS, 7:00 PM, JCP&L Co., 300 Madison Avenue, Morristown, N.J. Ken Oexle (JCP&L) (201) 455-8481.

Members and Non-Members Welcome
PLEASE POST

No. NJ Consultants' Network:
Avoiding 20 Questions And The IRS Section 1706

On September 28, 1995, the IEEE Consultants' Network of Northern NJ will present a talk on "Avoiding 20 Questions And The IRS Section 1706." The speakers will be Frank Lyons of AT&T Services and Karina Ukstins of Churchill Benefit Corporation. The Featured Presentation will be by Noah Horowitz of Dynatech International Elizabeth, N.J.

About The Topic
Frank Lyons explains how due to changing interpretations to federal tax laws many companies are moving away from the use of independent contractors and now use only consultants represented by an established consulting firm. He will examine the 20 Questions of IRS Section 1706 and show how they affect the engineering consultants in today's market. He will also discuss some of the options to consider and pitfalls to avoid in selecting a consulting firm.

Karina Ukstins explains how The Churchill Benefit Corporation being neither a head-hunting firm nor a consulting firm, provides protection from 1706 and offers other cost saving benefits of belonging to a group of independent consultants under one umbrella to provide a structured, stable environment that enables its members to enhance their business position. They offer options in group health insurance and pension programs. They also offer contract management, a robust expense reimbursement program, and paperwork processing of payroll and tax responsibilities.

About The Speakers
Frank Lyons has been a technical recruiter for the past two years after spending 17 years in the field of data processing. He has also worked in the fields of communications, publishing, retail sales, manufacturing, prescription fulfillment and educational testing. He is also a member of the New Jersey Bar.

Karina Ukstins is a sales and marketing professional in the computer consulting industry. She has a degree in communications from Moravian College, Bethlehem, PA. and achieved an Executive Masters of Business Administration from New York University. She is responsible for increasing the sales of Churchill Benefit by 300% in just eighteen months. She is also noted in the "who's who" in the 1994 *Sales & Marketing Today* sales register.

Presentation By Featured Consultant
Noah Horowitz is an international trade and export management specialist dealing with electrical and electronic commodities. He offers business services such as the preparation of financial reports, technical, marketing and legal trade agreements, product promotion and the selection of foreign distributors.

About The Consultants' Network
The IEEE Consultants' Network of Northern NJ was founded in April 1992 to encourage and promote the use of independent technical consultants by business and industry. Meetings are held on the last Thursday of each month. For a complimentary copy of the Directory of Consultants and Consulting Services call Alex Richardson (201) 535-3440.

Time: 7:30 PM, Thursday, September 28, 1995.
Place: AT&T Bell Laboratories, 67 Whippany Rd., Whippany, N.J.
Information: For directions or up-to-date meeting status call Robert Walker at (201) 736-0771.
Attendance: Non-Network attendees and member guests must pre-register by 5 PM Wednesday, Sept. 27th. Contact David Greenspan at (201) 8822-8562 (answering machine). Leave your name and citizenship information. Calls will not be returned.

North Jersey PES/IAS:
Flywheel Energy Storage In Electric Utility Applications

On November 16, 1995, the North Jersey Power Engineering/Industrial Application Society Chapters will present a talk on "Flywheel Energy Storage In Electric Utility Applications." The speaker will be John Price.

About The Talk
Flywheel battery technology is poised to play a revolutionary role in both electric vehicles and utility infrastructure development. The evolving technology will allow power generation combustion processes to be operated at optimum efficiency, enable effective exploitation of renewable energy sources, and provide point of service solutions to power quality problems experienced by utility customers with increasingly sensitive loads.

About The Speaker
John Price is a member of the University of Texas Center for Electro-mechanics Senior Engineering Staff. He is Co-Principal Investigator on a recently awarded contract to develop a flywheel-battery-based advanced locomotive propulsion system for the Department of Transportation. He is also leading efforts to develop electric utility applications for flywheel energy storage systems.

Time: 7:00 PM, Thursday, Nov. 16, 1995.
Place: Jersey Central Power & Light Co., 300 Madison Ave., Morristown, N.J.
Information: Ken Oexle (201) 455-8481.

NJ MTT/AP Chapter:
RF Components For Wireless Communication

On September 20, 1995, the IEEE North Jersey Section MTT/AP Chapter will present a talk on "Radio Frequency Components For Wireless Communication." The speaker at this meeting will be Shankar Joshi of Synergy Microwave Corporation, Paterson, N.J.

About The Talk
Detailed information on proper selection of RF components for wireless communication with special emphasis on electrical performance, packaging, and price will be discussed. Components include double- and triple-balanced mixers, harmonic mixers, frequency doublers, phase detectors, image reject mixers, modulators and demodulators, vector modulators, variable attentuators, VCOs synthesizers, and surface mount packaging techniques.

About The Speaker
Shankar Joshi, Engineering Manager, at Synergy Microwave Corporation, has over 20 years of design experience in the RF field to include VHF/UHF communication, spectrum analyzers and RF signal processing components. Prior to joining Synergy Microwave, Mr. Joshi worked as a Senior Design Engineer at Rohde & Schwarz, Long Island, N.Y. Mr. Joshi has five patents to his credit in the field of packaging and special RF components. He holds a Master's degree in Electrical Engineering. Mr. Joshi has published numerous articles in the various trade magazines.

All Welcome
You do not need to be an IEEE member to attend. All are welcome. Free refreshments will be provided starting at 6:15 PM and the meeting will start at 7:00 PM.

Time: 7:00 PM, Wednesday, September 20, 1995.
Place: NJIT, Engineering & Computer Center, ECE C202, 2nd Floor Conference Room. (Building located corner of Warren and Summer Streets, Newark, N.J.).
Information: Chandra Gupta (201) 633-4469 (GEC-Marconi); Edip Niver (201) 596-3542 (NJIT).

Study Of Mind/Matter Interactions

On October 19, 1995, the Metropolitan Section Engineering in Medicine and Biology Society will present a talk on "Scientific Study Of Mind/Matter Interactions-Princeton Engineering Anomolies Research" The speakers will be Prof. Robert G. Jahn and Brenda Dunne.

About The Talk

The Princeton Engineering Anomalies Research (PEAR) program was established at Princeton University in 1979 by Robert G. Jahn, Dean of the School of Engineering and Applied Science, to pursue rigorous scientific study of the interaction of human consciousness with sensitive physical devices, systems, and processes common to contemporary engineering practice. Since that time, an interdisciplinary staff of engineers, physicists, psychologists, and humanists has been conducting a comprehensive agenda of experiments and developing complementary theoretical models to enable better understanding of the role of consciousness in the establishment of physical reality. This research concentrates on three interrelated projects which will be covered in the talk: 1. Human/Machine Anomalies; 2. Remote Perception; 3. Theoretical Models.

About The Speakers

Professor Robert G. Jahn is a professor of aerospace sciences and Dean Emeritus of the School of Engineering and Applied Sciences at Princeton University. He is also the founder and Director of the Princeton Engineering Anomalies Research (PEAR) laboratory at Princeton University. Brenda Dunne, a clinical psychologist, is a member of the Princeton University research staff, and Manager of the PEAR laboratory. She is also the Executive Vice-President of the Society for Scientific Exploration which publishes the *Journal of Scientific Exploration*. PEAR research up to 1988 was described in the book "Margins of Reality" by R. Jahn & B. Dunne published by Harcourt Brace.

Time: Registration (no charge) 7:15, Lecture 7:30 PM , Thursday, October 19, 1995.

Place: Rockefeller Univ., Room 305 Weiss (formerly known as Tower Bldg.), 1200 York Avenue, NYC.

Directions/Parking: Entrance gate at 66th Street. Free parking. By subway—68th on #6 (Lex). By bus—M15, M31, M58, or M66.

Further Information: Joel Levitt (718) 891-6460; or Susan Baxt (516) 678-6563.

IEEE North Jersey Section Seminar
C++ FOR WINDOWS
Wednesdays, September 27 - November 29, 1995
Jersey Central Power & Light Co., 300 Madison Avenue, Morristown, N.J.

The North Jersey Section is offering an evening course entitled "C++ Programming for Windows." The Windows environment for personal computers is becoming increasingly important and will become even more important with the release of Windows 95. This course will cover all the major aspects of creating programs to run under Windows, using the C++ programming language. C++ is a prerequisite for the course. The emphasis is not on programming, however, but on the various components that have to be created for a Windows package: the interactive structure of the program itself, the message handling, the definition of resources, creating icons and cursors, the design of help and make files. The linking of data and programs within the Windows multiprogramming environment (DDE and OLE) will also be covered. This course is based on the Borland C++ development package, including ObjectWindows and the Resource Workshop. Therefore, every student should have access to Borland C/C++ Version 3.x or 4.x, as well as Microsoft Windows 3.1 or later. (Future plans may include another course, based on the Microsoft development package.) There will be nine weekly lectures which will be quite interactive, Homework will be assigned and corrected. The topics listed below will be covered. The instructor is Dr. Edward (Ted) Byrne, owner of a local software consultant business.

TOPICS:

(1) - Review of Microsoft Windows from a developer perspective. The desktop metaphor. Constituents of a window. The mouse. Characteristics of different kinds of window objects. Use of the File Manager. Use of the Application window.

(2) - Overview of the Borland C++ package: compilers, linkers, libraries, base classes and resources. Microsoft variable naming conventions.

(3) - Nature of an interactive Windows program: winMain, event handlers. Files that make up a windows program package. Constraints on a windows program. Standard versus enhanced mode.

(4) - Short review of C++: classes and objects. Inheritance and virtual functions. Overloading. The C++ switch/case statement and use in handling messages. The Borland C++ Base Classes.

(5) - Other aspects of a Windows program package: creating icons. Creating Help. Concept of hypertext. Creating new cursor shapes. Saving program state from one execution to the next.

(6) - Kinds of boxes: the dialog box, menu, accelerator keys, buttons (radio, check boxes, bitmapped buttons). Designing your own control boxes.

(7) - Creating output in your program's window. Print output, Pixel output. Bitmap files. Choosing, sizing and using fonts.

(8) - Communication between tasks or applications: passing data, the clipboard. More general communications, Dynamic Data Exchange (DDE). Using parts of one windows program in another: Object Linking and Embedding (OLE).

(9) - What next?: how to create an install package for your Windows program. Interacting with the Windows Program Manager. Introduction to Windows 95.

Class size will be limited to a maximum of 25 with a minimum registration of 15. Early registration is recommended. Phone reservations will NOT be accepted. Reservations accepted after September 15, 1995 will require an additional late fee of $25. No reservations will be accepted after September 22, 1995.

Where: Jersey Central Power & Light Co., 300 Madison Avenue, Morristown, N.J.
When: Nine sessions, Wednesday evenings starting Sept. 27, 1995, 6:30 - 9:00 PM.
Cost: With Text Book only: IEEE Members $225; Non-IEEE Members $325.
Contact: Mr. John A. Baka at (201) 455-8534 (Business)

Registration "C++ FOR WINDOWS"

To: Mr. John Baka, Distribution Engineering, JCP&L Company, 300 Madison Avenue, Morristown, NJ 07962-1911

Name _____ IEEE No._____

Affiliation _____ Phone No. _____

Address _____

_____

Please enclose required fee payable to **North Jersey Section IEEE.**

Signature _____

A ONE-DAY IEEE SEMINAR ON
HARMONICS AND POWER QUALITY IN ELECTRICAL DISTRIBUTION SYSTEMS
Presented by the IAS and PES Chapters, North Jersey Section

Wednesday, September 27, 1995, 8:30 AM to 3:30 PM
Jersey Central Power and Light HQ, 300 Madison Ave., Morristown, NJ 07962

Non-linear loads (those that draw non-sinusoidal load currents from a sinusoidal voltage source) generate harmonic current and voltage components, while periodically-varying loads that modulate the fundamental-frequency current generate interharmonics (currents and voltages at frequencies that are rational fractions of the fundamental). Non-power-frequency components propagate through the electrical distribution system, causing puzzling problems. Typical examples are transformer overheating (or derating to avoid overheating), overheating of synchronous-machine rotor bars, blowing of capacitor bank fuses due to resonance at a harmonic frequency, communications interference, control system malfunctions, erroneous firing of thyristor converters, CRT image fluctuations, and lighting flicker. The main sources of harmonics are static power converters including rectifiers, ac and dc adjustable speed drives, power supplies of electronic devices such as computers, communications equipment, and numerically-controlled machine tools; electric discharge lighting; and arc furnaces.

Harmonics-related problems can only become more common as microelectronics power supplies and adjustable-speed drives account for an ever-growing proportion of the load (predicted to exceed 50% in some areas by the year 2000). The "60Hz" power system is rapidly becoming a thing of the past; engineers need to know how to design, analyze, and operate distribution systems that carry 60 Hz plus a substantial load of other frequencies.

This seminar is designed for industrial-plant, power utility, and commercial-building power system engineers. It will provide a comprehensive introduction to power system harmonics: where they come from, their effects, and how to analyze and alleviate them.

TOPICS

- Introduction and Overview
- Sources of Harmonics
- Practical Definition for Powers in Systems with Nonsinusoidal Waveforms
- Harmonic Analysis including Harmonic Load Flows

- Effect of Harmonics on:
  - Utility Distribution
  - Industrial Distribution
  - Instrumentation and Control Power Systems
- Impact on Drive Systems
- Shunt Capacitors and Resonance

- Synchronous Machines
- Induction Machines
- Inverter Power Supplies
- Harmonic Filters and Applications
- Harmonic Measurements
- Standards Governing Limits on Harmonics
- Open Discussion

Seminar Leaders

Richard H. McFadden, P.E., Fellow, IEEE. Chief Electrical Engineer, Advanced Technology Division, Science Applications International Corp., New York, NY.

R. Vittal Rebbapragada, P.E., Senior Member, IEEE. Senior Consulting Engineer - Electrical Power Systems, Ebasco Services Division, Raytheon Engineers and Constructors, New York, NY.

Cost - including materials, morning refreshments, and luncheon:

IEEE members	$150.00
Non-members	$195.00
Students with valid ID	$50.00

Reserve your place by mailing a check payable to **"IEEE North Jersey Section"** to R.H. McFadden, SAIC, 7 West 36th St., New York, NY 10018. Call-in reservations are welcome. **$50.00 DISCOUNT FOR FULL (NON-STUDENT) REGISTRATIONS POSTMARKED BY SEPT. 20!**

For information or registration, call Dick McFadden, 212-239-8510; Vittal Rebbapragada, 212-839-1473; or Ken Oexle, 201-455-8481.

IEEE North Jersey Section Seminar
Object-Oriented C++ Programming
Tuesdays, September 26 - December 5, 1995
Jersey Central Power & Light Co., 300 Madison Avenue, Morristown, N.J.

The North Jersey Section is offering an evening course entitled "Object-Oriented C++ Programming." Object-Oriented programming has been described as the biggest advance in computer programming since the creation of higher level languages 30 years ago. Instead of focusing on functionality (what the programs do) it focuses on the natural objects comprising the problem and how they, and their capabilities, are modeled in the program. C++ is, by far, the most widely used language today for object-oriented design and programming. This course will cover both the concepts of OOD and their implementation in C++ code. The course will begin with a review of common aspects of C and C++ but this time will be too brief to learn C. THEREFORE ONLY THOSE WHO ARE FAMILIAR WITH C SHOULD REGISTER FOR THE C++ COURSE.

There will be ten weekly lectures and homework will be assigned and corrected. The topics listed below will be covered. The instructor is Dr. Edward (Ted) Byrne, owner of a local software consultant business.

TOPICS:

(1) - Review common elements of C and C++; punctuation and key words, variable naming, typing & scope, functions & subfunctions, arguments, operators & assignments, conditionals and logical variables, looping & testing, handling text strings, arrays & structures, pointers.

(2) - Concept of Object-Orientation: objects & classes of objects, methods & messages, encapsulation & abstraction, overloading of functions & operators, inheritance & polymorphism.

(3) - C++ improvements to C: new commands and operators, comments, stream I/O, function prototypes, more explicit typing and linking.

(4) - C++ implementation of objects: what is a C++ object, data and method functions within an object, public, private and friend, static and dynamic objects, constructors and destructors.

(5) - Encapsulation and abstraction within C++ objects: references and aliases, scope control operator, 'this' object, overloading, functions, operators.

(6) - Inheritance and polymorphism among C++ objects: parent class or object, extending classes, redefining object data and methods, multiple inheritance, templates.

(7) - C++ I/O streams: standard I/O, formatted I/O with manipulators, disk and device I/O.

(8) - C++ library classes and their use: characteristics of a good library class, conversion base classes, video base classes, window base classes, database base classes.

(9) - Overall program structure with C++ objects: how to lay out a C++ program, how to reuse classes in a program, how to test and evolve a C++ program, how to find errors and debug C++ object programs.

(10) - Object-Oriented design methodologies: Booch method, Coad Yourdon Nicola method, Shlaer Mellor method.

Class size will be limited to a maximum of 25 with a minimum registration of 15. Early registration is recommended. Phone reservations will NOT be accepted. Reservations accepted after September 15, 1995 will require an additional late fee of $25. No reservations will be accepted after September 22, 1995.

Where: Jersey Central Power & Light Co., 300 Madison Avenue, Morristown, N.J.
When: Ten sessions, Tuesday evenings starting Sept. 26, 1995, 6:30 - 9:00 PM.
Cost: With Text Book and Borland Turbo C++ Compiler: IEEE Members $320, Non-IEEE Members $420.
With Text Book only: IEEE Members $200; Non-IEEE Members $300.
Contact: Mr. John A. Baka at (201) 455-8534 (Business)

Registration "Object-Oriented C++ Programming"

To: Mr. John Baka, Distribution Engineering, JCP&L Company, 300 Madison Avenue, Morristown, NJ 07962-1911

Name _____ IEEE No. _____

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Check if Borland Turbo C++ Compiler is needed or not: Yes [ ]   No [ ]

Please enclose required fee payable to **North Jersey Section IEEE.**

Signature _____

AN IEEE SEMINAR ON
GETTING THE MOST OUT OF YOUR ELECTRIC POWER SYSTEM:

HOW TO OBTAIN HIGHER PRODUCTIVITY, LOWER COSTS, AND BETTER PROFITABILITY FROM YOUR EXISTING SYSTEM

Presented by the IAS and PES Chapters, North Jersey Section

Wednesday, October 25, 1995, 9:00AM to 3:00PM
Jersey Central Power and Light HQ
300 Madison Ave., Morristown, NJ 07962

Topics

- Introduction
    - Seminar overview
    - Basic concepts
        - Costs of power problems
        - Factors that affect system productivity
        - Reliability, availability, maintainability
        - Preventive maintenance
        - Life extension

- System productivity evaluation
    - Single-line diagram
    - Walkdown inspection
    - Capacity and expandability evaluation
    - Power quality assessment
    - Energy efficiency evaluation
    - Reliability and availability assessment
        - Techniques and tools
            - FMEA and other hazards analyses
            - Reliability block diagrams
            - Fault trees
            - Computer tools
        - Reliability and availability data
            - Collecting and analyzing plant data
            - Generic data

- System productivity improvement
    - Identifying and upgrading critical items
    - Productivity-centered maintenance
        - The PCM concept
        - Benefits of PCM
        - Database development
        - Procedures review
        - "Smart" databases and AI resources
        - Maintenance tracking and closeout
        - Inspection and testing
        - Trending maintenance and test results
        - Managing a living PCM program
    - Improving energy efficiency
    - Improving power quality
    - System life extension

- Justifying investments in power system hardware or maintenance upgrades
    - Life-cycle costing
    - Investment analysis concepts
    - Probabilistic cost-benefit analysis

- Final overview and discussion

Seminar Leaders

Richard H. McFadden, P.E., Fellow, IEEE. Chief Electrical Engineer, Advanced Technology Division, Science Applications International Corp., New York, NY.

R. Vittal Rebbapragada, P.E., Senior Member, IEEE. Senior Consulting Engineer - Electrical Power Systems, Ebasco Services Division, Raytheon Engineers and Constructors, New York, NY.

Cost - including materials, morning refreshments, and luncheon:

IEEE members	$150.00
Non-members	$195.00
Students with valid ID	$50.00

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For information or late registration, call Vittal Rebbapragada, (201) 804-2011; Ken Oexle, (201) 455-8481, or Dick McFadden, (212) 239-8510