

The



# IEEE Newsletter

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

*NJ Section PACE:*

## Manpower Issues

Your Professional Activities Committee will meet on Wednesday, August 14, 2002, to discuss manpower issues and Member's professional needs.

### About the meeting

High on the list of subjects is unemployment and the displacement of American citizens by foreign workers imported under the H-1B legislation. This year the legislation increased the number of H-1B workers to about 200,000 while citizens have been disregarded as "Over Qualified." And, please do not confuse this as an "immigration" issue. This is all about money and wage busting.

The PACE meeting is open to discuss our Members' professional needs. PACE provides IEEE Members with the opportunity to meet, address, discuss and perhaps improve the professional aspects of the engineering profession. Members should take advantage of the opportunity to have a place and time to meet with their associates to discuss their profession.

While checking with PACE Leaders, I found high on the list of IEE-USA goals this year "Employment Assistance and Career Development due to the worsening economy." More on these projects can be found at [www.ieeeusa.org](http://www.ieeeusa.org).

Any suggestions may be emailed to Richard F. Tax at [rtax@bellatlantic.net](mailto:rtax@bellatlantic.net).

### Welcome!

You do not have to be a member of the IEEE to attend. Members of other professional societies and engineering disciplines are always welcome.

**Time:** 6:30 to 8:30 PM, Wednesday, August 14, 2002.

**Place:** Clifton Memorial Library, 292 Piaget Ave., Clifton, NJ 07011, (973) 772-5500.

**Information:** Richard F. Tax, (201) 664-6954, [rtax@bellatlantic.net](mailto:rtax@bellatlantic.net).

*NJ Consultants' Network:*

## .NET, C#, and What's Next?

On Tuesday, September 10<sup>th</sup>, 2002, the IEEE North Jersey Computer Chapter will host a presentation on ".NET, C#, and What's Next?" by Edward (Ted) R. Byrne, PhD.

### About the Talk

Some of us think that we are in the Computer Business or in the Information Technology Profession. However, it's actually more like a technology war with Microsoft, SUN, IBM, and others attempting to gain a competitive advantage that will make their competitors technology obsolete. And if you happen to be practicing in an area targeted for extinction, it might help to know what the trends are so you can steer yourself toward a technology that has a brighter future.

Microsoft has begun a new offensive in this technology warfare with their release of '.NET.' '.NET' is designed to drive a wedge into the Internet business where they expect to find their next buried treasure. '.NET' also has aimed a killer missile, called C#, at JAVA. In fact, Microsoft won't be too worried if it also displaces or wounds C++ or their own Visual Basic.

This talk will describe the goals and concepts of '.NET'- what it gives us, and what it takes away. Also C# will be described and compared with JAVA and C++. HTML has also been bulked up to become XML and is another soldier in the campaign. We will discuss where it fits.

### About the Speaker

Edward (Ted) R. Byrne, PhD, has described himself as a software engineer, developer and consultant (and a fascinated MS-watcher).

He operates his own consulting practice, Flatland Computer Specialties, Inc. His practice consults on software requirements and software development engineering techniques, and provides training in C or C++ programming, Object Oriented Analysis, or other developmental methodology. He also provides specialized software packages for businesses that include generation of bar or postnet codes, creation of user interfaces for controllers, and the merger of check mail lists.

### All Welcome!

You do not have to be a member of the IEEE or of the Consultants' Network to attend. Networking after the meeting is encouraged. There is no charge for admission. Bring your friends.

**Time:** 7:00 PM, Tuesday, September 10, 2002. Pre-meeting dinner 5:30 PM, at the Hanover Marriott, Hanover, NJ, (973) 538-8811.

**Place:** Public Meeting Room, Morris County Library, 30 E. Hanover Ave, Whippany, NJ, (973) 285-6930.

**Information:** Howard Leach (908) 255-1634 or [h.leach@ieee.org](mailto:h.leach@ieee.org).

# August 2002

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### IEEE NJ SECTION HOME PAGE

<http://www-ec.njit.edu/~ieeenj/>

### IEEE NJ SECTION NEWSLETTER HOME PAGE

<http://www-ec.njit.edu/~ieeenj/NEWSLETTER.html>

### REPORT ADDRESS CHANGES TO:

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**The North Jersey Section Executive Committee usually meets the first Wednesday (except holidays and December) of each month at 7:00 PM. Meetings are open to all members. For information on meeting agenda contact Secretary Wayne Owens at (201) 767-3400, ext. 226, [wowens@crestron.com](mailto:wowens@crestron.com).**

## NJ Signal Processing Chapter:

# Autocorrelation Matching - A Second-Order Statistics Theory on Blind MIMO-FIR Channel Equalization for Wireless Communications

On Wednesday, September 18, 2002, the IEEE North Jersey Section Signal Processing Society Chapter will host a presentation on "Autocorrelation Matching - A Second-Order Statistics Theory on Blind MIMO-FIR Channel Equalization for Wireless Communications." The speaker will be Dr. Hui Luo.

### About the Talk

Blind MIMO-FIR system equalization techniques refer to a category of signal processing methods that are designed to recover a number of unknown input signals distorted by an unknown MIMO-FIR system from the output signals of this system based on some statistical information about the input signals and/or some structure information about the system model. When these techniques are developed for wireless MIMO communication systems, they are also referred to as blind MIMO-FIR channel equalization techniques, and the objective is to boost spectral efficiency using antenna arrays such that high-data-rate content, such as multimedia signals, can be transmitted using a limited bandwidth.

This talk first introduces a SOS (second-order statistics) based theory on blind MIMO (multiple input multiple output) FIR system equalization. The theory states that, given an MIMO FIR system with the autocorrelation functions of input signals satisfying a linear shift-independence condition, the MIMO-FIR system is equalized and every output signal equals an input signal up to a scalar and a delay, if and only if some SOS of output signals are identical to that of input signals. Based on this theory, this talk then proposes a new wireless MIMO communication technique, called the Autocorrelation Matching Method, which consists of the following steps:

1. filtering each information signal using a distinct pre-filter such that the autocorrelations of the filtered signals satisfy the linear shift-independence condition
2. transmitting all filtered signals simultaneously over the same carrier
3. receiving signals using an antenna array with spatial diversity
4. detecting filtered signals by applying an MIMO-FIR equalizer to the

received signals such that the autocorrelations of the output signals of the MIMO-FIR equalizer matches that of the filtered signals

5. recovering information signals by reverse filtering the detected signals
6. identifying the scalar and the delay for every recovered information signal.

This method can be applied to cellular networks as well as wireless LAN for the purpose of improving spectrum efficiency or suppressing co-channel interference. A close-form algorithm is given to compute the optimal zero-forcing equalizer that can minimize the noise power in the output signal. Computer simulation results are presented to verify the theory and demonstrate the performance of the Autocorrelation Method.

### About the Speaker

Hui Luo received his PhD, MSEE, and BSEE degrees in 1994, 1991, and 1990 respectively, all from the Department of Automation, Tsinghua University, Beijing, China. From 1995 to 1997, he was a postdoctoral research associate with the Department of Electrical Engineering, University of Notre Dame, where his research area was blind signal processing. From 1998 to 1999, he worked as an R&D Engineer with Digital Video Express LP, where his research area was digital watermarking. Since mid 1999, he has been working with AT&T Labs - Research, where his research areas include wireless/mobile networking, cryptography applications on networks, and signal processing for wireless communications. He is now a Principle Technical Staff Member with AT&T Labs - Research.

### All Welcome!

You do not have to be an IEEE member to attend. Light refreshments will be served at 4:30 PM.

**Time:** 4:45 PM, Wednesday, September 18, 2002.

**Place:** New Jersey Institute of Technology (NJIT), Room 202, ECE Center, Newark, NJ. Directions are available at [www.njit.edu](http://www.njit.edu).

**Information:** Dr. Yun-Qing Shi, (973) 596-3501, [shi@njit.edu](mailto:shi@njit.edu), Dr. Alfredo Tan, (201) 692-2347, [tan@mailbox.fdu.edu](mailto:tan@mailbox.fdu.edu), or Dr. Hong Man (201) 216-5038, [hman@stevens-tech.edu](mailto:hman@stevens-tech.edu).

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*PES/IAS:*

## **National Electric Code and Uniform Construction Code Updates**

On October 17<sup>th</sup>, 2002, the Power Engineering and Industrial Applications Chapters will sponsor a technical meeting on recent changes to the National Electric Code and revisions to Uniform Construction Code. The speaker will be Won Kim, PE, an Associate with Eckland Consultants.

**Time:** 7:00 PM, Thursday, October 17, 2002.

**Place:** PSE&G Training Center, Edison, NJ. Directions: Route 287 to Route 1 North, about 500 feet. Right on Pierson Road. PSE&G first driveway on left.

**Information:** Ken Oexle (973) 386-1156.

## **IEEE North Jersey Section Activities August 2002**

**Aug. 7**—"NJ Section Executive Committee Meeting" – 7:00 PM, ITT, 100 Kingsland Rd, Clifton, NJ. Wayne Owens at (201) 767-3400 ext. 226 or [wowens@crestron.com](mailto:wowens@crestron.com).

**Aug. 14**—"Manpower Issues" – NJ PACE, 6:30 – 8:30 PM, Clifton Memorial Library, 292 Piaget Ave, Clifton, NJ. Richard F. Tax, (201) 664-6954, [rtax@bellatlantic.net](mailto:rtax@bellatlantic.net).

### **Upcoming Meetings**

**Sept. 4**—"NJ Section Executive Committee Meeting" – 7:00 PM, ITT, 100 Kingsland Rd, Clifton, NJ. Wayne Owens at (201) 767-3400 ext. 226 or [wowens@crestron.com](mailto:wowens@crestron.com).

**Sept. 10**—"NET, C#, and What's Next?" – NJ Consultants' Network, 7:00 PM, Public Meeting Room, Morris County Library, 30 E. Hanover Ave, Whippany, NJ. Howard Leach (908) 255-1634 or [h.leach@ieee.org](mailto:h.leach@ieee.org).

**Sept. 18**—"Autocorrelation Matching - A Second-Order Statistics Theory on Blind MIMO-FIR Channel Equalization for Wireless Communications" - NJ Signal Processing Chapter, 4:45 PM (light refreshments at 4:30 PM), NJIT, 202 ECE Center, Newark, NJ. Dr. Yun-Qing Shi (973) 596-3501, Dr. Alfredo Tan (201) 692-2324 [tan@mailbox.fdu.edu](mailto:tan@mailbox.fdu.edu) or Dr. Hong Man (201) 216-5038 [hman@stevens-tech.edu](mailto:hman@stevens-tech.edu).

**Oct. 17**—"National Electric Code and Uniform Construction Code Updates" - NJ IAS/PES Chapters, 7:00PM, PSE&G Training Center, Edison, NJ. Ken Oexle (973) 386-1156.

**Oct. 18**—"Power Transfer Switch Seminar" – NJ IAS/PES Chapters, 9:00 AM to 3:00 PM, Automatic Switch Company, 50 Hanover Road, Florham Park, NJ. For additional information contact Vittal Rebbapragada at (609) 720-3209 or [r.rebbapragada@ieee.org](mailto:r.rebbapragada@ieee.org).

**Members and Non-Members Welcome  
PLEASE POST**



*Photo taken by John Upton*

Nirwan Ansari, Section Chair, addresses gathering at Awards Reception



*Photo taken by Anne Giedlinski*

Ken Oexle receives Power Engineering Chapter Award from Roland Dixon, PES Chapter Representative, Region 1



*Photo taken by Anne Giedlinski*

Roland Dixon (2<sup>nd</sup> from left), PES and IAS Chapter Representative, Region 1, recognized Ken Oexle, Vittal Rebbapragada and Won Kim for Industrial Application Chapter accomplishments and outstanding chapter designation



*Photo taken by Anne Giedlinski*

New Fellows at the Award Reception with Nirwan Ansari (2<sup>nd</sup> from left)  
(L-R Krishnaswamy Nagaraj, Juergen Schroeter and James Johnston)





*Photo taken by Anne Giedlinski*

Nirwan Ansari presents Region 1 Award to Amit Patel for distinguished service to students and new graduates pursuing electrical engineering careers

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## Advance To Senior Member Grade

To become a Senior Member, you need ten years experience. A Bachelors Degree counts for three of those years and Master and Doctorate degrees each count for one more year of experience. You don't have to be an IEEE member for ten years. You don't have to be a genius to become a Senior Member but in order to qualify for Fellow grade, you must be a Senior Member. The dues for Senior Members, Members and Associates are the same. New Senior Members will receive an engraved wood and bronze Senior Member plaque from the IEEE.

To get information and an application, contact Don Weinstein, Kulite Semiconductor, One Willow Tree Road, Leonia, NJ 07605-2239, (201) 461-0900 ext 234 mornings, FAX (201) 461-0990, email don@kulite.com.

**Please include your mailing address.**

## 2004 IEEE Fellow Nominations

Deadline: 15 March 2003

Recognizing the achievements of its members is an important part of the mission of the IEEE. The IEEE grade of Fellow is conferred upon a person of "outstanding and extraordinary qualifications and experience in IEEE designated fields, and who has made important individual contributions to one or more of these fields." The total number of Fellows selected each year does not exceed 0.1% of the total IEEE membership.

Any person, including nonmembers, is eligible to serve as a nominator with the following exceptions: members of the IEEE Board of Directors, members of the IEEE Fellow Committee, IEEE Technical Society/Council Fellow Evaluating Committee Chairs, members of IEEE Technical Society/Council Evaluating Committees reviewing the nomination, or IEEE staff. The deadline for nominations is 15 March 2003.

The candidate must be an IEEE Senior Member at the time the nomination is submitted, and he/she must have completed 5 years of service in any grade of IEEE membership.

All the necessary material to assist you in the nomination process is available on the IEEE Web site: <http://www.ieee.org/about/awards/fellows/fellows.htm>. If you prefer a hard copy, please send an e-mail to fellow-kit@ieee.org. Include your name, street address, city, state/province, postal code, country, and telephone/fax numbers.

## North Jersey Student Activities Committee and GOLD Seek Volunteers and Speakers

The NNJ IEEE SAC and GOLD are seeking new volunteers to help conduct business at the section level for the benefit of students in the North Jersey section and surrounding areas. Additionally local student chapters are seeking speakers to give talks on professional and technical topics.

If you would like to speak on professional topics ranging from career development, time or project management, engineering experiences, and many more, or have specific technical topics and developments you would like to contribute, or even have some pet topics of your own, please contact the organizer below.

Additionally, the NNJ SAC is seeking volunteers to get involved at the section level to help organize local events for students and the GOLD membership in the NY-NJ Metro area. If you would like to help out even for short periods of time or maybe take on leading a committee in the section, please contact the organizer Amit Patel (a.j.patel@ieee.org) to find out more and come to a section business meeting.

## IEEE Members Now Receive Discount on MIT Advanced Study Program Courses

Massachusetts Institute of Technology Advanced Study Program (MIT ASP) has become an IEEE Education Partner. IEEE members can now continue their life long learning with graduate-level, credit courses provided by MIT at a 10% discount. Current ASP courses include Systems Dynamics, a 24-month certificate program, and Economic Concepts for Engineers, a semester-long course.

Offered over the Internet since 1995, the ASP is in its 33<sup>rd</sup> year of providing courses to off-campus graduates. Taught by MIT faculty, the online delivery takes advantage of the latest in technologies for working engineers to keep pace with developments in their fields or to enlarge their knowledge base. Admission is based on the applicant's academic and professional background.

Applications, course pre-requisites, and systems requirements are detailed at the MIT-supplied website for IEEE members. You must use your IEEE member number to receive the 10% discount.

Enter through the IEEE Educational Partners, <http://www.ieee.org/EduPartners>, and choose MIT from the university partners. To learn more about the IEEE Education Partners Program contact Sasha Eydlin, IEEE Educational Activities, s.eydlin@ieee.org.

NJ PES/IAS:

## Power Transfer Switch Seminar

The PES and IAS Chapters will present a technical seminar on the design, operation and application of industrial grade low – medium voltage (120 thru 15000 volt) power transfer switches. The session will be held at Automatic Switch Company, 50 Hanover Road in Florham Park, NJ, on Friday October 18, 2002 beginning at 9:00AM.

### About the Seminar

Topics to be covered include:

- Power Transfer Switch Design and Construction
- Industry Codes and Standards
- Power Switching Applications
- Controls and Communication Systems for Transfer Switching
- Transfer Switch Ratings
- Tour of ASCO/Emerson Switch Assembly and Test Facility

Mr. Ronald Schroeder, Director – Product Management Power Switching and Controls, will lead the seminar and be assisted by other members of the staff at Automatic Switch (a Division of Emerson Electric). Ron has over 30 years of experience in the design and application of power transfer switches to meet specific application requirements. A graduate of Kean University, he is a member of IEEE.

The registration fee for this seminar prior to October 4<sup>th</sup> will be \$175 (non-IEEE members), \$125 (IEEE Members), and \$50 (students with valid ID). The fee will be waived for IEEE Life Member Grades with advance registration and verification at the seminar. Registrations after October 4<sup>th</sup> must include an additional late fee of \$25. The seminar fee includes lunch, refreshments and handouts. Non-members joining IEEE within 30 days of the seminar will be rebated 50% of the IEEE registration charge.

**Time:** 9:00 AM to 3:00 PM, Friday, October 18, 2002.

**Place:** Automatic Switch Company, 50 Hanover Road, Florham Park, NJ 07932 (973-966-2000). Directions: From Route 80 Take I-287 to Exit 37 (NJ 24 East - Springfield). Take NJ 24 East to Exit 2B (Columbia Turnpike). Proceed 2.2 miles to Hanover Road (6<sup>th</sup> set of traffic lights). Turn left on Hanover Road (Afton Restaurant). Automatic Switch will be on the right (0.4 mile). Enter first driveway-marked shipping/receiving and proceed to visitor parking lot on the left. Follow sidewalk to office entrance door.

**Information:** R. Vittal Rebbapragada, PE, (609) 720-3209 or r.rebbapragada@ieee.org.

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*Registration: Power Transfer Switch Seminar, 10/18/2002*

Register via US mail to:

K. Oexle  
11 Deerfield Rd  
Whippany, NJ 07981

Name \_\_\_\_\_

Address \_\_\_\_\_

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Payment Enclosed \$ \_\_\_\_\_ Add \$25 late registration after October 4<sup>th</sup>, 2002.

**Make Check payable to North Jersey Section IEEE**