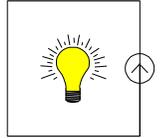




# The Central Virginia Current



Vol. 5, No. 2

Newsletter of the IEEE Central Virginia Section

April 2004

## IEEE Section Meeting - Tuesday April 27, 2004

### Integrated Wireless Networks - Dr. Kenneth A. Ballard - CTA Communications, Inc.

#### Integrated Wireless Networks

**Speaker:** Dr. Kenneth A. Ballard, Project Manager, CTA Communications, Inc., Lynchburg, VA

**Where:** Vinny's Grill and Pizzeria, 7001 Timberlake Road, Lynchburg, VA 24502

**When:** April 27, 2004  
6:00 P.M. Social  
6:30 P.M. Dinner  
7:00 P.M. Section Business  
7:15 P.M. Speaker

**Directions:** Follow the link for "Next Meeting" on our web site: [www.cvaieee.org](http://www.cvaieee.org)

**RSVP:** Please RSVP to Carlos Whaley ([carlos.whaley@ieee.org](mailto:carlos.whaley@ieee.org) or (434) 258-4962) by 1:00 PM on April 26, 2004 so we know approximately how many to expect.

**Abstract:** The U.S. Department of Justice, Department of the Treasury, and the Homeland Security Department operate a wide variety of communications systems for their Law Enforcement components and bureaus. These aging legacy systems have been plagued with problems in recent years. The legacy systems are characterized by channel crowding and congestion, lack of capacity, inadequate radio coverage, obsolete equipment and limited capability for interoperability. These major deficiencies, plus a number of other operational and technical concerns such as interference and reliability, currently inhibit federal law enforcement personnel from operating at full capacity and efficiency. The NTIA narrowband mandate, which restructures both the VHF and UHF bands by 2005 and 2008, respectively, is driving the departments to replace and upgrade systems. And finally, the events of 9/11/01 have put a spotlight on the Government's ability to protect the U.S. borders, and wireless communications is a major factor here.



This paper presents an overview of plans for the Integrated Wireless Network (IWN), as the federal government moves towards a major upgrade of its wireless communications systems. CTA Communications has been the engineering firm at the forefront of this design, and is assisting the Joint Program Office (JPO) in the initial implementation and testing of a Beta System in western Washington state, planned for completion later this year. CTA has recommended that DOJ, the Treasury and HSD combine their resources to replace conventional legacy radio equipment with a modern P.25 trunked radio system. The envisioned network would consolidate all law enforcement operations onto a joint radio system that would eventually encompass the entire nation, providing sufficient capacity for current and future operations through 2018.

**About our Speaker:** Dr. Ballard has 25 years of engineering experience with two-way radio communications systems, RF propagation, antenna design, and aerospace electronics. His career has included early experiences with both the Electronic Warfare Lab and the Atmospheric Sciences Lab at White Sands Missile Range, graduate study in the Radiophysics Lab at the Thayer School of Engineering while at Dartmouth, as well as leadership roles with GE Aerospace and Ericsson Private Radio Systems division.

Dr. Ballard was born & raised in El Paso, Texas. He received his B.S. in Physics from UTEP (1973), his M.S. in Engineering Science from Thayer School of Engineering, Dartmouth College (1976), and his Ph.D. in Engineering Science from Thayer School of Engineering, Dartmouth College (1981). His graduate work primarily dealt with radio wave propagation, E&M fields, communications, etc. His Master's and Doctoral thesis focused on traveling ionospheric disturbances.

Dr. Ballard was the "Lead Wireless Architect" for the Integrated Wireless Network design project with DOJ, and is now the Project Manager for CTA in the Beta system development & implementation phase.

## **IEEE Central Virginia Section Organization**

### **Chair:**

Carlos Whaley  
E-mail: [carlos.whaley@ieee.org](mailto:carlos.whaley@ieee.org)  
Phone: (434) 258-4962

### **Vice Chair:**

Larry Heine  
E-mail: [l.heine@ieee.org](mailto:l.heine@ieee.org)  
Phone (540) 833-5142

### **Secretary/Treasurer:**

Grace Giras  
E-mail: [g.e.giras@ieee.org](mailto:g.e.giras@ieee.org)  
Phone: (434) 974-2061

### **Professional Activities:**

Eric Christenson  
E-mail: [eric\\_christenson@ieee.org](mailto:eric_christenson@ieee.org)

### **Web Site Coordinator, Membership Chair, Newsletter Editor, SAMIEEE Coordinator:**

Larry Heine  
E-mail: [l.heine@ieee.org](mailto:l.heine@ieee.org)  
Phone: (540) 833-5142

### **Central VA Web Site:**

[www.cvaieee.org](http://www.cvaieee.org)

## **2004 IEEE Systems and Information Engineering Design Symposium**

April 16, 2004

Omni Charlottesville Hotel  
Charlottesville, VA

[www.sys.virginia.edu/sieds04/](http://www.sys.virginia.edu/sieds04/)

## **Thought for Today:**

“Kindness is more important than wisdom, and the recognition of this is the beginning of wisdom”

- Theodore Isaac Rubin

## **June Social being planned**

We are planning to have a social event in June. Details are not available yet but our initial thought was to have a Sunday afternoon get-together at a local winery. If you have any suggestions, please contact one of the Section officers.

## **The IEEE's Member Digital Library**

The IEEE Member Digital Library brings IEEE members instant on-line access to the full-text of all IEEE journals, magazines, transactions, letters or conference papers published within the last five years. Subscribers to the IEEE Member Digital Library can file, view, and print and up to 25 articles each month in an electronic filing cabinet. Once in your file cabinet, the document is yours to access any time, until its publication date falls beyond five years.

The cost is \$35 monthly. A minimum 12-month commitment is required.

For more information, please see the IEEE's web site: <http://ieeexplore.ieee.org/Xplore/DynWel.jsp> and follow the link at the lower left for “Access the IEEE Member Digital Library” under “Member Services”.

## **Call for Track Chairs**

IEEE Southeast Conference 2005 (SEC 2005)

Ft. Lauderdale, Florida, April 8-10, 2005

SoutheastCon is the annual IEEE Region 3 Technical, Professional, and Student Conference. It brings together Computer Scientists, Electrical, and Computer Engineering professionals, faculty and students to share the latest information through technical sessions, tutorials, and exhibits. It is the most influential conference in Region 3 for promoting awareness of the technical contributions made by our profession to the advancement of engineering science and to the community. As usual, attendance and technical program participation from areas outside IEEE Region 3 are encouraged and welcomed.

The conference Technical Program/Proceedings Committee solicits proposals for organizing and hosting tracks. Perspective track chairs should submit an intent letter to chair a track in the IEEE SEC 2005. Proposals should be short and include: name, affiliation/organization, track intending to chair, and a short bio. A preliminary list of tracks is available at the Southeast Con web site: [http://sec05.nova.edu/technical\\_program\\_track\\_list.htm](http://sec05.nova.edu/technical_program_track_list.htm)

New tracks or modifications of the proposed tracks are welcome.

Track chairs will be responsible for:

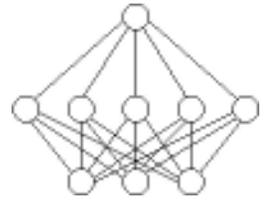
- Assisting in soliciting the call for paper
- Assisting in soliciting paper reviewers
- Assisting in acknowledging authors and classifying manuscripts
- Review papers in their track
- Make rejection/acceptance decision for reviewed manuscripts
- Send rejection/acceptance notification to authors
- Coordinate with the technical program/proceedings chair on papers' statistics

# IEEE Section Meeting - Tuesday May 18, 2004

## Artificial Neural Networks: From Early Days to Present Fruition - Roger L. Barron - Barron Associates

<b>Where:</b>	Room 316, Thornton Hall, UVa Charlottesville, VA
<b>When:</b>	Tuesday May 18, 2004 6:30 P.M. Pizza provided by section 7:00 P.M. Section Business 7:15 P.M. Speaker
<b>Directions:</b>	Follow the link for "Next Meeting" on our web site: <a href="http://www.cvaieee.org">www.cvaieee.org</a>
<b>RSVP:</b>	Please RSVP to Grace Giras ( <a href="mailto:g.e.giras@ieee.org">g.e.giras@ieee.org</a> or (434) 974-2061) by 1:00 PM on Tuesday May 18 so we know how much pizza to order.

**Abstract:** McCulloch and Pitts postulated the formal mathematical logic of a rudimentary artificial neuron in 1943. Sixty years later, more flexible artificial neurons, interconnected in powerful Artificial Neural Networks (ANNs), have come into widespread use. These ANNs are not the "thinking machines" of science fiction, but are able to perform sophisticated tasks in modeling from data. For pattern recognition, prediction, control, and signal processing, achieved with accuracy, reliability, and computational efficiency, ANNs are becoming the method of choice when dealing with complex processes not amenable to classical procedures.



The most important strides along the ANN road since 1943 were:

- Incorporating reinforcement learning
- Developing algorithms for learning the structures of ANNs
- Applying long-established theorems and tools of statistical modeling, statistical inference, and multivariate optimization
- Moving away from special-purpose hardware toward software embodiments (computational ANNs)
- Demonstrating success in the real world

This presentation will outline the evolution of ANN technology from its beginning to the present, with emphasis on aerospace applications, and will include anecdotes from the career of one who lived the subject intensely for 40 years.

**About our Speaker:** Roger L. Barron is recognized for his pioneering and advancement of polynomial neural networks and their applications, founding the first neurocomputing company in 1960 and continuing to produce innovative and proven results for over 40 years. In 1983, Mr. Barron founded a small privately held company, Barron Associates, with a view toward applying intelligent modeling and control algorithms to advanced aerospace applications, and to do so in a small business environment where every customer would get the individualized attention of a small group of experienced researchers. Today, Barron Associates is in its second generation of ownership, but it continues in the tradition started by Roger L. Barron by providing leadership in computational neural networks, controls and statistical modeling. Over the last two decades, Barron Associates has grown its expertise and introduced hundreds of new customers in the aviation, space and health systems industries to its advanced and innovative R&D, tools, services and solutions.

Roger L. Barron received his B.S. in Aeronautical Engineering from Princeton (1955), his S.M in Aeronautical Instrumentation & Control from M.I.T. (1957). He was the founder and CEO of Adaptronics, Inc., McLean, VA, '61-'82, and Barron Associates, Inc., Charlottesville, VA, '83-'98.

## K-12 Educational Activities:

When you were growing up, did you always have an interest in science and engineering? Your parents probably have (or had) stories of how you were always taking things apart to see how they worked. If you were lucky, you found an adult engineer who took you under his or her wing and introduced you to our amazingly interesting and challenging profession. Maybe it was a parent, or a neighbor, or a scoutmaster, or someone at a radio club. Whoever it was, they helped to shape your life as an engineer.

Would you like to have that same positive impact on the lives of children in your community who have an interest in engineering?

Some additional ideas for K-12 activities include:

- An electricity demo from the Virginia Council - consists of a stationary bicycle, an attached generator, and switched loads so students can experience how much effort is needed to light the various loads.
- The IEEE's National Educational Activities Program has lesson plans for in-service training for math and science teachers.

Please contact Carlos Whaley ([carlos.whaley@ieee.org](mailto:carlos.whaley@ieee.org) or (434) 258-4962) if you would like to assist with one of these programs.



## Important Membership Notes:

If you see the word "Arrears" to the right of your membership grade and membership number above your name and address, you have not paid your 2004 IEEE dues and you are no longer receiving IEEE printed publications. We have sent you this newsletter as a friendly reminder that your dues have not been paid. If you are unemployed or are earning less than \$11,300 per year, you may renew your membership including one society for 50% of the normal rate. For more information about these and other payment options, please visit the IEEE web site at [www.ieee.org](http://www.ieee.org), select "Membership" and then "Understanding Membership" from the left navigation bar.

Do you have a colleague that doesn't belong to the IEEE but would benefit from membership? They can join now and save 50% on their first year's dues. For more information, please visit the IEEE web site at [www.ieee.org](http://www.ieee.org) and select "JOIN" from the top navigation bar.

## Would you enjoy helping us organize a Section meeting?

The Central Virginia Section's Executive Committee is looking for individuals in the Charlottesville, Lynchburg, and Harrisonburg areas who would be willing to help us organize a technical or professional meeting. If you are willing or if you have any ideas for meeting topics, please contact one of the Section officers (see p.2 for contact information).



## IEEE April, May & June 2004 Calendar of Events

- Tuesday April 27 - Integrated Wireless Networks, Vinny's Grill and Pizzeria, 7001 Timberlake Road, Lynchburg, VA
- Tuesday May 18 - Artificial Neural Networks: From Early Days to Present Fruition - Room 316 Thornton Hall, UVa, Charlottesville, VA
- June - Spring Social - time and place to be announced.

**MEMBERS: Please post in your workplace!**  
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Institute of Electrical and Electronics Engineers, Inc.  
Central Virginia Section  
PO Box 351  
Lacey Spring, VA 22833