



Phil's Quill

When writing things like resumes or any thing that people quickly scan over, it's recommended to include lots of white space, for readability. However, upon glancing at the events calendar in this bulletin, the abundance of white space is disturbing. The lack of activity in the Pittsburgh section chapters is only symptomatic of a larger problem in our society – a lack of volunteerism. This situation has been analyzed in a book I read recently: Bowling Alone: The Collapse and Revival of American Community by Robert D. Putnam. He has done extensive research on why membership in civic organizations is down, and while total numbers of professionals in professional societies is up, membership as a percentage of professionals is also down, including the IEEE.

There are many reasons for this: the work environment is less stable due to downsizing; there is less company loyalty, but more time spent at work; more contract workers; suburban life has led to more isolation and more commuting time; emphasis on volunteering was much more pronounced in the older generation. The decline in volunteering began with the baby boomers and continued to decline among generation Xers. There is however an increase in individual volunteering that is not tied to a civic, church or other type of organizations, particularly among the older generation and a slight trend upwards among those in their early twenties. These trends apply not only to volunteering, but also to membership in general types of community organizations. For instance, two of us on the executive committee belong to a community brass band, bucking the trend. This kind of activity is becoming less common.

The author's suggestions to reverse this trend apply on several fronts. First, he suggests that schools do a better of job of civics education and encourage regular community service projects and extra-curricular activities. Smaller schools provide more opportunities. He suggests employers have more flexible work schedules, part time work and provide meeting rooms for clubs, encouraged by tax incentives. I recommend this book to anyone interested in the social factors affecting our own organization.

-Phil Cox

Photonic Switching – In the Small, the Medium and the Large

Prof. Richard A. Thompson, University of Pittsburgh
Director, Graduate Program in Telecommunications



Practical devices and fabric architectures are described for space-division switching in which the throughput data remain in optical form. Photonic timeslot interchange is described and, after reviewing time-multiplexed space switching, photonic fabrics that switch in space and time are described. After discussing wavelength interchange, the limitations of wavelength multiplexing, and devices that perform wavelength-multiplexed space switching, photonic fabrics that switch in space and wavelength are described. All these concepts are merged in a discussion of elementary photonic fabrics that switch in space, time, and wavelength. Finally, a photonic-switched global network architecture is proposed that uses "capacity switching," a form of real-time facility switching.

Dr. Richard Thompson has been a Professor of Telecommunications at the University of Pittsburgh since 1989, after 20 years at Bell Labs. He is the Director of Pitt's Telecom Program and has a secondary appointment in Pitt's EE Department. His BS and MS degrees, each in EE, are from Lafayette College and Columbia University, respectively. His Ph.D., in Computer Science, is from the University of Connecticut. While Dr. Thompson's principal research expertise is circuit switching and telephony, especially photonic switching, he has started a new research project, using probabilistic automata theory to model the statistical dependence of packets in real networks.

Place : 501 IS Building
University of Pittsburgh
135 N. Bellefield Ave

Date : October 26th, 2001

Program : 4:00 – 5:00 PM

For more information, please contact Prashant Krishnamurthy at (412) 624-5144 or by e-mail at prashant@tele.pitt.edu.

Section News

If your group has an announcement for The Bulletin, please forward it to Mike Boccabella at m.boccabella@ieee.org, or call (724) 387-1934. All information has to be in by the 10th of the month before publication. For November, please have all information in by October 10th.

If you would like to receive the bulletin via e-mail, please send your request to m.boccabella@ieee.org. Please consider doing this. E-mail distribution will save postage for the section. Your bulletin will be e-mailed to you earlier, and it will be in Adobe PDF format. This format is used extensively on the World Wide Web. Free readers are available to view and print the bulletin. Check out previous bulletins on our web-site www.literati.com/ieee/bulletin. A link to Adobe Reader is also available at this location.



Network Design for Wireless Internet
Dr. Joseph Kabara, University of Pittsburgh
Assistant Professor, Graduate Program in Telecommunications

The growth of cell phones clearly illustrates the demand for universal connectivity. Having accepted mobile access to voice as a given, users are now beginning to demand similar access to data. To satisfy this demand requires the truly pervasive wireless Internet, which, in turn, requires a supporting wireless access network infrastructure. Currently, wireless network planning tools are aimed at coverage based design; that is ensuring that an adequate signal-to-interference ratio (SIR) is maintained in the area to be provided service. This criteria is well suited to current wireless voice and low speed data rate services. However, emerging wireless access networks, which focus primarily on data service, require a fundamentally different approach to network design. As demand for data and the variety of services increase a signal-coverage based design is insufficient. To provide mobile users with consistent access to the Internet and quality of service guarantees (QoS) requires a network designed to provide users with a specified data rate, thus requiring a possibly large aggregate data rate (fat pipe) be provided to specific geographic areas. However, spectrum limitations prevent universal coverage with these fat pipes, and therefore, to achieve coverage goals, some geographic areas must be allocated less aggregate data rate capacity (thin pipes). A network design solution must account for user density, expected user subscriber profiles, traffic models for various applications, and support for QoS classes, in addition to standard radio level requirements (i.e., adequate SIR). Support for these requirements in turn requires designing the wireless network topology based on a bit rate density criterion.

Dr. Joseph Kabara, an assistant professor in the Department of Information Science and Telecommunications at the University of Pittsburgh, obtained the Ph.D. in Electrical and Computer Engineering from Vanderbilt University (1997), the MS in Electrical Engineering from Johns Hopkins University (1991), and BS in Electrical Engineering from Marquette University (1987). His research interests are in wireless network design, embedded neural networks and wireless local area networks.

Place : 501 IS Building
University of Pittsburgh
135 N. Bellefield Ave
Date : November 16th, 2001
Program : 4:00 – 5:00 PM

For more information, please contact Prashant Krishnamurthy at (412) 624-5144 or by e-mail at prashant@tele.pitt.edu.

VOLUNTEERS NEEDED FOR THE FUTURE CITY COMPETITION

The Engineer's Society of Western Pa. (ESWP) in conjunction with the Carnegie Science Center will present the Future City Competition 2002 in the Pittsburgh area.

The Future City Competition, asks middle school students to create – first on computer and then in large, three-dimensional models -- their visions of the city of tomorrow. Engineers of all disciplines are needed to volunteer as mentors for the competition

As a mentor, you will share your engineering skills in helping to develop teamwork, problem solving and applied math and science. You will work with a team of (3) students and a teacher in developing a city of the future on the SimCity computer program. For the regional competition in January, you will help the team to build a model of one portion of their city, and prepare a presentation to be evaluated by a team of judges. We will try to match volunteer mentors with schools near their home or the work place.

If you are the parent of a Middle School student (7th or 8th grade), this is an excellent opportunity to spend time with your children in a learning project. The Competition begins this fall. More information is available online. Visit the ESWP website at <http://www.eswp.com/monthly1.htm>.

If you are interested in volunteering or have any questions, please call or email:

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IEEE Pittsburgh Section
IEEE Communications Society
Tutorial on Wireless Systems and Technologies
Professors from the Telecommunication Dept
University of Pittsburgh



The IEEE Communications Society Pittsburgh Chapter along with the IEEE Pittsburgh Section is sponsoring a tutorial on Wireless Systems and Technologies to be held during October/November 2001 at Tollgrade Communications in Cheswick. The course will cover the background material and aspects of modern wireless systems and technologies spanning radio propagation, modulation, coding, spectrum regulation, frequency planning, mobility management, cellular telephone networks, wireless data networks, wireless LANs and PANs. Professors from the Telecommunications Program at the University of Pittsburgh will teach the tutorial.

Date	Session	Instructor	
Oct. 22 nd	A: 6:00 – 7:20 PM	David Tipper	Introduction to Wireless Networks and Systems
	B: 7:30 – 8:50 PM	Richard Thompson	Analog Modulation and Digital Transmission
Oct. 29 th	C: 6:00 – 7:20 PM	Prashant Krishnamurthy	Radio Propagation Fundamentals
	D: 7:30 – 8:50 PM	Prashant Krishnamurthy	Digital Modulation and Coding in Wireless
Nov. 5 th	E: 6:00 – 7:20 PM	Richard Thompson	AMPS/Intersystem Operation and Mobility Management
	F: 7:30 – 8:50 PM	David Tipper	GSM and GPRS
Nov. 12 th	G: 6:30 – 7:50 PM	Martin Weiss	Spectrum Regulation and Policy Issues
	H: 8:00 – 9:20 PM	Prashant Krishnamurthy	CDMA: IS-95 and IMT-2000
Nov. 19 th	I: 6:00 – 7:20 PM	Joswph Kabara	Wireless Local Area Networks
	J: 7:30 – 8:50 PM	Prashant Krishnamurthy	Wireless Personal Area Networks and Conclusion

Handouts of the presentations in class will be made available on the web in Acrobat PDF or Microsoft Powerpoint format and they will be handed out as hard copies in class. Some recommended references are:

1. *Digital Communications: Fundamentals and Applications* 2nd Edition. by Bernard Sklar, Prentice Hall PTR, 2001.
2. *Wireless Information Networks* by Kaveh Pahlavan and Allen Levesque, John Wiley and Sons, 1995.
3. *Wireless Personal Communications Systems* by David Goodman, Addison-Wesley, 1997.
4. *Mobile Communications* by Jochen Schiller, Addison-Wesley, 2000.

Please visit the course website www.tele.pitt.edu/~comsoc/wireless_tutorial.html for more details.

Students should have knowledge of Fourier Transforms, basic communication theory, calculus and probability. Access to a scientific computation software package (Matlab or MathCAD) is necessary.

Attendees who complete the following requirements will earn 1.4 Continuing Education Units (CEU).

1. Attend at least 8 of 10 sessions
2. Complete and hand in all homework assignments. These will not be graded.
3. Complete and hand in course evaluation form

Place: Tollgrade Facility, Cheswick PA
Date: October 22nd and 29th, November 5th, 12th, and 19th 2001.
Program: 6:00 to 9:00 PM, except as noted above for Nov. 12th
Cost: \$50 for IEEE members, \$75 for others

To register, please send a check payable to "Pittsburgh Section IEEE" to Tom McDermott, 1800 Jefferson Ridge Drive, Jefferson Hills, PA 15025. Please indicate your IEEE member number on your check. For more information, contact Prashant Krishnamurthy at prashant@tele.pitt.edu.

Directions:

From Route 28 North:

Take Route 28 North to Exit 12, Springdale/Cheswick. At the end of the exit ramp, make a right at the stop sign onto Nixon Road. Go straight at the next stop sign. Tollgrade is located approximately 1/10th of a mile on the right, in Harmar Industrial Manor.

From the Turnpike (I-76)

Take the Turnpike to Exit 5, Allegheny Valley. Go straight through the toll booth toward Cheswick/Springdale/New Kensington. The exit ramp goes onto Freeport Road, North. At the first traffic light make a left onto Pearle Avenue. Follow it about 3 miles. It will become Russellton Road. At the Texaco station, turn left onto Nixon Road. Tollgrade is located approximately 1/10th of a mile on the right, in Harmar Industrial Manor.

2001-2002 Pittsburgh Section IEEE Program Calendar

Group/Society	September	October	November	December	January	February	March	April	May
ExecCom Phil Cox (412) 820-1302	20 Pitt	18 WVU	15 Point Park	20 Point Park	17 Point Park	21 Point Park	21 Point Park	18 Point Park	16 Point Park
Section Mtngs Phil Cox (412) 820-1302	22 Fall Picnic	22, 29 Wireless Tutorial	5, 12, 19 Wireless Tutorial			National Engineers Week		History Dinner	
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Computer Gerry Kumnik (412) 487-1430									
Communication Prashant Krishnamurthy (412) 624-5144		26 Photonic Switching	16 Wireless Internet						
Power Eng. Gregory Reed (724) 772-2158									
Membership Jim Karn (412) 732-9000									
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