Date of event	Page	Sponsor	Location
Nov 6	4	GBC/ACM PDS	MIT
Nov 16	5	SPIN	General Dynamics Needham
Nov 23	1& 5	IEEE & GBC/ACM	Mitre, Bedford
Dec 15	3	GBC/ACM	MIT

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The Official Newsletter of the Greater Boston Chapter of the acm

The Real Times

Vol.38 No.9 www.gbcacm.org November 1999

Special Presentation of the IEEE Computer Society Distinguished Visitor Program and theGreater Boston ACM

Co-Sponsors along with Computer, Aerospace and Electronics Systems, Control Systems, Communications, Information Theory, Robotics and Automation, Signal Processing, Antennas and Propagation, Components, Packaging, & Manufacturing Technology, Education, Electron Devices, Engineering Management, Geoscience and Remote Sensing, and Instrumentation & Measurement Societies.

5:30 PM, Tuesday, 23 November 1999

Hanscom Conference Center Theater (formerly the Phillips Lab Auditorium) in Bldg. 1106 (next to Lincoln Laboratory)

From Computing with Numbers to Computing with Words–From Manipulation of Measurements to Manipulation of Perceptions

Lotfi A. Zadeh, Professor in the Graduate School and Director, Berkeley Initiative in Soft Computing (BISC), Computer Science Division and the Electronics Research Laboratory, Department of EECS, University of California, Berkeley, CA

We are very fortunate to have the originator of the Field of Fuzzy Logic (for which he received the IEEE Medal of Honor, its highest award) give us a lecture on the latest developments in this field. Following is a description of his talk.

Computing, in its usual use, is centered on manipulation of numbers and symbols. In contrast, computing with words, or CW for short, is a methodology in which the objects of computation are words and propositions drawn from a natural language, e.g., small, large, far, heavy, not very likely, the price of gas is low and declining, Berkeley is near San Francisco, it is very unlikely that there will be a significant increase in the price of oil in the near future, etc.

A basic difference between perceptions and measurements is that, in general, measurements are crisp whereas perceptions are fuzzy. We cannot build robots which can move with the agility of animals or humans; we cannot automate driving in heavy traffic; we cannot translate from one language to another at the level of a human interpreter; we cannot create programs which can summarize non-trivial stories; our ability to model the behavior of economic systems leaves much to be desired; and we cannot build machines that can compete with children in the performance of a wide variety of physical and cognitive tasks.It may be argued that underlying the underachievements and failures is the unavailability of a methodology for reasoning and computing with perceptions rather than measurements. An outline of such a methodology -- referred to as a computational theory of perceptions (CTP) -- is presented in this talk.

(talk description and bio continued on page 5)

Directions

The talk will be held at 5:30pm Tuesday, November 23rd, at the Hanscom Conference Center Theater (formerly the Phillips Lab Auditorium) in Bldg. 1106 next to Lincoln Laboratory. The directions to this facility are: from Route 128 (95) take Route 4 and 225 exit to Bedford. At first light (about 200 yards from Rte. 128) make left turn onto Hartwell Avenue (must actually make right turn to make left turn at light). Go straight to Hanscom Base Gate 4 entrance (about 1.0 mile from turn). Proceed to first light after gate (about 0.4 miles). Go left at light onto Grenier Street. Proceeding up the hill to a stop sign (there is a power plant on the left). Make a left here and then take your first right. The parking lot will be on your right. Go down steps from parking lot to Hanscom Conference Center Auditorium in Bldg. 1106, the center wing of the E-shaped building in front of you. For further information, contact either Marcia Nizzari at (617) 856-1804 or Dr. Eli Brookner at (978) 440-4007.

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Timely notices of events, meetings, and other activities of interest to the Chapter's Membership should be submitted by the 10th of the month Before the intended issue and sent, with attention to the Managing Editor to:

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Address changes should be sent to the mailing address above. Allow eight to ten weeks for changes to address or membership renewal to become effective. Send old label with address modifications.

In Memoriam
W. Richard Stevens, 1951 - 1999

We are deeply saddened to learn of the death on September 1 of noted author and former pds speaker W. Richard Stevens. He is best known for his ``UNIX Network Programming'' series (1990, 1998, 1999), ``Advanced Programming in the UNIX Environment'' (1992), and ``TCP/IP Illustrated'' series (1994, 1995, 1996). His passing is obviously a tremendous loss for the technical community, but it is a personal one for us as well. Rich was both a gifted colleague and a friend who will be greatly missed. We extend our sympathies to his family.

Richard was born in 1951 in Luanshya, Northern Rhodesia (now Zambia), where his father worked for the copper industry. He received a B.SC. in Aerospace Engineering from the University of Michigan in 1973, and an M.S. (1978) and Ph.D. (1982) in Systems Engineering from the University of Arizona. He moved to Tucson in 1975 and from then until 1982 he was employed at Kitt Peak National Observatory as a computer programmer. From 1982 until 1990 he was Vice President of Computing Services at Health Systems International in New Haven, CT. In 1990 he moved back to Tucson to pursue his career as an author and consultant. He was also an avid pilot and a part-time flight instructor during the 1970's.

He is survived by his wife of 20 years, Sally Hodges Stevens and three children, Bill, Ellen and David. The family asks that in lieu of flowers, donations be made in Richard's name to Habitat for Humanity, 2950 E. 22nd Street, Tucson, AZ 85713.

Websites of some Local Groups

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www.siggraph.org/chapters/boston

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Return this form to GBC/ACM PDS, PO Box 465, Lexington, MA 02420-0005

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Fall 1999 PDS Program

General Information

Schedule:
8:30am - 9:00am Registration
9:00am - 12:15pm Morning session (break at 10:30am)
12:15pm - 1:30pm Lunch (provided on-site)
1:30pm - 4:30pm Afternoon session (break at 2:30pm)

Registration Fees:
Seminar materials, lunch, and refreshments are included in the $80 fee. Registrants not current members of the GBC/ACM are charged an additional $10, and become members of the chapter for a year. This is distinct from ACM membership. Surcharge for on-site registration is $10. Purchase orders, credit cards, faxes and e-mail cannot be accepted. Enrollment is limited and on a first come, first served basis. Early registration must be made by a check or money order at least three weeks in advance of the seminar to receive confirmation from GBC/ACM.

Location:
MIT Building 54, Room 54-100 is located on the 2nd floor of the "Green Building" (the name not the color), which is an 18 story building in the center of the MIT campus. It is the tallest building at MIT with a large sphere (radar dome) on top

Parking:
There is free parking on Vassar Street all Saturday and there is a parking structure surrounded by a parking lot at the corner of Vassar and Main.

Public Transportation:
Red line to Kendall Square. Walk west on Main Street to Ames Street; turn left on Ames Street, and walk to the triangular shaped building (building 66). Turn right, and walk on the path keeping building 66 on your right, and you will reach a courtyard. On your left, you will see an 18 story building with a large sphere on the top. Room 54-100 is the lecture hall on the 2nd floor of that building.

Questions: See: http://www.gbcacm.org or call: (781)862-1181

Saturday November 6, 1999
Design Patterns for Java Servlets
Dan Jacobs

Overview:
This presentation talks about the use of server-side Java in general and Java servlets in particular, for building large, complex, dynamic websites. It focuses on the kinds of design problems that commonly occur and on how the use of Design Patterns can help to organize the design of complex web server based Java applications so that they can grow and evolve effectively.

Objectives:
To explain how to write servlets more effectively using design patterns.

Seminar Topics:
- Overview of server-side Java and Java Servlets
- Overview of Design Patterns
- Servlet life-cycle details and API overview
- Problems building complex networks of dynamically generated pages
- A few guiding principles
- Addressing different problems with a focus on relevant patterns

Lecturer:
Dan Jacobs is President of Tech Tonic Netsystems, a software engineering contracting and consulting group based in Burlington, specializing in object-oriented software engineering and internet applications. Dan has 20 years of R&D experience in object-oriented languages, systems, databases and applications, and has been developing Java applications, user interfaces, and servlet-based dynamic web sites as the founder of Tech Tonic since January 1996.

Session Chair: Peter Mager (p.mager@computer.org)

Books:
Design Patterns CD, by Gamma, Helm, Johnson, & Vlissides, published by Addison-Wesley (PDS price $25.00, List $29.95)
Java Servlet Programming by Jason Hunter, William Crawford, Paula Ferguson, published by O'Reilly & Assoc (PDS price: $25, List $32.95)

Lotfi A. Zadeh Talk

(continued from page 1)

The computational theory of perceptions, or CTP for short, is based on the methodology of computing with words (CW). In CTP, words play the labels of perceptions and, more generally, perceptions are expressed in a natural language into what is called the Generalized Constraint Language (GCL). In this language, the meaning of a proposition is expressed as a generalized constraint, X isr R, where X is the constrained variable, R is the constraining relations and isr is a variable copula in which r is a variable whose value defines the way in which R constrains X. Among the basic types of constraints are: possibilitisic, veristic, probabilistic, random set, Pawlak set, fuzzy graph and usuality. The wide variety of constraints in GCL makes GCL a much more expressive language than the language of predicate logic.

In CW, the initial and terminal data sets, IDS and TDS, are assumed to consist of propositions expressed in a natural language. These propositions are translated, respectively, into antecedent and consequent constraints. The consequent constraints are derived from the antecedent constraints through the use of rules of constraint propagation. The principal constraint propagation rule is the generalized extension principle. The derived constraints are re-translated into a natural language, yielding the terminal data set (TDS). The rules of constraint propagation in CW coincide with the rules of inference in fuzzy logic. A basic problem in CW is that explicitation of X, R and r in a generalized constraint, X isr R, which represents the meaning of a proposition, p, in a natural language.

There are two major imperatives for computing with words. First, computing with words is a necessity when the available information is too imprecise to justify the use of numbers; and second, when there is a tolerance for imprecision which can be exploited to achieve tractability, robustness, low solution cost and better rapport with reality. Exploitation of the tolerance for imprecision is an issue of central importance in CW.

At this juncture, the computational theory of perceptions -- which is based on CW -- is in its initial stages of development. In time, it may come to play an important role in the conception, design and utilization of information/intelligent systems. The role model for CW and CTP is the human mind.

Lotfi A. Zadeh joined the Department of Electrical Engineering at the University of California, Berkeley, in 1959, and served as its chairman from 1963 to 1968. He has held a number of visiting appointments at MIT, IBM Research Laboratorym AI Center, SRI International, the Center for the Study of Language and Information, Stanford University and is currently a Professor in the Graduate School, and is serving as the Director of BISC (Berkeley Institute in Soft Computing).

Until 1965, Dr. Zadeh's work had been centered on system theory and decision analysis. Since then, his research interests have shifted to the theory of fuzzy sets and its applications to artificial intelligence, linguistics, logic, decision analysis, control theory, expert systems and neural networks. Currently, his research is focused on fuzzy logic, soft computing, computing with words, and the newly developed comp utational theory of perceptions.

An alumnus of the University of Teheran, MIT, and Columbia University, Dr. Zadeh is a fellow of the IEEE, AAAS, ACM and AAAI, and a member of the National Academy of Engineering. He held NSF Senior Postdoctoral Fellowships in 1956-57 and 1962-63, and was a Guggenheim Foundation Fellow in 1968. Dr. Zadeh is the recipient of numerous and varied awards, medals and honors. Among these are: the Rufus Oldenburger Medal, the Grigore Moisil Prize, the Okawa Prize, the B. Bolzano Medal, the J.P. Wohl Career Achievement Award, the Edward Feigenbaum Medal by the International Society for Intelligent Systems, and the Richard E. Bellman Control Heritage Award by the American Council on Automatic Control. In addition, he received the Information Science Award from the Association for Intelligent Machinery and the SOFT Scientific Contribution Memorial Award from the Society of Fuzzy Theory in Japan. In 1999, he was elected to membership in Berkeley Fellows and IFSA (International Fuzzy Systems Association). He was awarded the Certificate of Merit, IFSA.

Dr. Zadeh holds honorary doctorates from universities all over the world and has authored close to two hundred papers as well as serving on the editorial boards of over fifty journals. He is a member of many technological and scientific advisory boards and steering committees involved with research of fuzzy systems and artificial intelligence. Zadeh is the originator of the field of Fuzzy Logic, and is a Professor in the Graduate School and Director, Berkeley Initiative in Soft Computing (BISC), Computer Science Division and the Electronics Research Laboratory, Department of EECS, University of California.

November Boston SPIN Talk
November 16, 1999 7pm
James Bach
"Good Enough Quality"
General Dynamics, Building 5, 77 "A" Street, Needham, MA

(see web page <http://www.cs.uml.edu/Boston-SPIN **> for additional information)**

Books for Sale

GBC/ACM has the following books from previous seminars still available for sale. They are available on a first come first served basis. Checks will be returned if the book is no longer available.

Title	Author	List Price	ACM Price	Quantity	Total
The JAVA Programming Language	Ken Arnold	$34.38	$25.00		
The HTML3 Manual of Style	Larry Aronson	$24.95	$10.00		
The Java Swing Book	Eckstein, Loy, Wood	$44.95	$35.00		
About Face: The Essentials of User Interface Design	Alan Cooper	$29.25	$15.00		
Working with Active Server Pages	Michael Corning	$39.99	$25.00		
JAVA: How to Program (with CD)	Paul Deitel	$99.95	$55.00		
JAVA: How to Program (book only)	Paul Deitel	$51.00	$40.00		
The SGML FAQ Book: Understanding the Foundation of HTML and XML	Steve DeRose	$68.00	$55.00		
The Web Security Reference Guide	Lincoln Stein	$29.95	$20.00		
Real-Time Systems Design and Analysis	Phil LaPlante	$69.95	$55.00		
The C++ Programming Language, 3rd Ed	Bjarne Stroustup	$42.99	$30.00		
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GBC/ACM December Meeting

Date: **Wednesday, 15-Dec-99**

Time: Refreshments at 6:30 PM, Lecture at 7:00 PM
Location: To be determined (and published on the GBC/ACM web site at <http://www.gbcacm.org>)
Subject: **MMIX: A RISC Computer for the New Millennium**
Speaker: **Donald E. Knuth**, Professor Emeritus of The Art of Computer Programming at Stanford University

Abstract:

In this talk Prof. Knuth will describe MMIX, a 64-bit RISC computer that will replace MIX as the environment for explaining machine-level details in future editions of his "The Art of Computer Programming". He will explain the architecture and why he is excited about it.

MMIX operates primarily on 64-bit words. It has 256 general-purpose 64-bit registers that each can hold either fixed-point or floating-point numbers. Most instructions have the 4-byte form "OP X Y Z", where each of OP, X, Y, and Z is a single 8-bit byte. If OP is an ADD instruction, for example, the meaning is "X=Y+Z"; i.e., "Set register X to the contents of register Y plus the contents of register Z." The 256 possible OP codes fall into a dozen or so categories.

The designers of important real-world processor chips (e.g., MIPS and ALPHA) helped Don with the design of MMIX. So while being forward-looking, MMIX is also realistic.

Don has provided a lot of information about MMIX on the web. The main MMIX page is at
<http://www-cs-faculty.stanford.edu/~knuth/mmix.html>
and the MMIX opcode chart is at
<http://www-cs-faculty.stanford.edu/~knuth/mmop.html>.

Here are some compressed PostScript files with more information about MMIX:
* The programmer's introduction to MMIX (that will eventually appear as Sections 1.3 and 1.4 of The Art of Computer Programming, Volume 1) currently designated Sections 1.3' and 1.4': An introduction to MMIX and MMIXAL (424KB of compressed PostScript)
<http://www-cs-faculty.stanford.edu/~knuth/fasc1.ps.gz>
* Definition of architecture details (142KB of compressed PostScript)
<http://www-cs-faculty.stanford.edu/~knuth/mmix-doc.ps.gz>
* Definition of the assembly language and loader format (61KB of compressed PostScript)
<http://www-cs-faculty.stanford.edu/~knuth/mmixal-intro.ps.gz>
* Definition of simple I/O, the runtime environment, and the simulator's online/offline interaction commands (46KB of compressed PostScript)
<http://www-cs-faculty.stanford.edu/~knuth/mmix-sim-intro.ps.gz>

Donald Knuth is one of the most distinguished computer scientists of our time. He is the recipient of many awards including the first ACM Grace Murray Hopper Award (1971), the ACM Turing Award (1974), the ACM Software Systems Award (1986), the IEEE John von Neumann Medal (1995), and the Kyoto Prize (1996). He is a graduate of Milwaukee Lutheran High School, Case Institute of Technology, and the California Institute of Technology. In addition, he has received more than 20 honorary doctorates. He has been a professor of computer science at Stanford since 1968 and Emeritus Professor of the Art of Computer Programming since 1993. Currently he is visiting the MIT AI Lab, where he has been delivering a set of lectures on "God and Computers" and the 3:16 project.

Don is probably best known for his books, especially the multi-volume opus "The Art of Computer Programming". He developed a new paradigm for typesetting that is embodied in TEX and METAFONT, and has expounded the concept of literate programming and developed tools such as CWEB to support it. He is the author of at least 159 refereed publications and at least another 173 non-refereed ones. Further information can be found on his web page at <http://www-cs-faculty.stanford.edu/~knuth/>.

Knuth's God and Computer lectures "Things a Computer Scientist Rarely Talks About" are accessible online at <http://www.technetcast.com/tnc_program.html?program_id=50> or go to <http://web.mit.edu/bpadams/www/gac/> to find out more about the "God and Computer" Lecture series. Knuth is also giving a number of talks on computer science issues while at MIT. Go to the MIT web page at <http://www-eecs.mit.edu/current/events/> to find out more.