**Advance Program**

**NOVEMBER 8-11, 1977**

**COMPSAC77**

SHERATON-O'HARE MOTOR HOTEL / CHICAGO O'HARE AIRPORT

The IEEE Computer Society's First International Computer Software & Applications Conference

**CHICAGO**

**Committee**

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U.S. Army Computer Command

David Hsiao
Ohio State University

Seymour Jeffery
National Bureau of Standards

Ira Kay
Southern Simulation Service, Inc.
QUANTITATIVE MANAGEMENT: SOFTWARE COST ESTIMATING

COURSE OUTLINE:
This tutorial will cover the life cycle costing of large-scale application software from two viewpoints: that of a government sponsor and that of a contract software developer.
- Need for manpower, cost, and schedule at RFP time.
- Life cycle model.
- Management implications.
- Quantitative application of life cycle model including control, risk analysis, and dynamic simulation of requirements changes.
- Six costing methods used in industry.
- Two software case histories.
- Influence of incentive fees.
- Cost estimating algorithms.

LECTURERS:
Colonel Lawrence H. Putnam is special assistant to the Commanding General, U.S. Army Computer Systems Command. He has been developing quantitative management tools to control software development for the last three years.
Ray W. Wolverton is a computer Scientist in the Office of Software Research and Technology, TRW Systems Group. He has been developing and applying software cost estimating algorithms in an industrial environment for many years.

PROGRAM TESTING

COURSE OUTLINE:
This tutorial covers the latest technology, tools, and techniques; effectiveness; and management methods of systematic program testing.
- The motivating forces and basic principles of program testing.
- The theoretical foundations of testing, including directed graph theory, reliable test theory, and statistics.
- The tools and techniques for performing program testing.
- Technology of planning and measurement during program testing.
- Techniques for management of program testing.
- Assessment of research and development activities and the future of program testing.

LECTURERS:
Edward F. Miller, Jr., is a consultant with Software Research Associates, San Francisco. He has fifteen years experience in the computer field, the last six of which have concentrated on program testing problems. He received his PhD from the University of Maryland in 1968.
Leon Stucki is systems development program manager with Boeing Computer Services, Seattle. He has ten years experience in the computer field, the last six of which have been concerned with software engineering. He received his PhD from the University of California, Los Angeles, in 1976.

SOFTWARE DESIGN TECHNIQUES

COURSE OUTLINE:
This tutorial is a survey of the technical aspects of software design, emphasizing those activities which occur between the specification of a problem and the programming of its solution.
- The importance of design and specification; differences between design and programming.
- Survey of design techniques: abstraction, modularity, design representations, complete software development methodologies.
- Ideas on changing current practices.
- Intended for programmers with two to five years experience and managers desiring to use modern software development methods; not intended for experienced designers.

LECTURERS:
Peter Freeman is Assistant Professor of Information and Computer Science at the University of California, Irvine. His current research interests include software design and the development of new approaches to teaching software design. He has written over twenty papers on various aspects of software design and software engineering, and is the author of Software Systems Principles. He received his PhD from Carnegie-Mellon University.
Anthony I. Wasserman is Assistant Professor of Medical Information Science at the University of California, Berkeley. His current research interests include programming language design, software engineering, and techniques for the design of interactive systems. Wasserman received his PhD from the University of Wisconsin at Madison.
WEDNESDAY, November 9, 1977

9:30 a.m. OPENING SESSION
Welcome and Introduction
Stephen S. Yau, General Chairman
Address by President of IEEE Computer Society
Merlin G. Smith
Address by President of IEEE
Robert M. Saunders
Keynote Address
Ted Cлимis, Vice-President of Development, IBM General Products Division

WEDNESDAY AFTERNOON (Parallel Sessions)
1:30 p.m. - 3:00 p.m.
SESSION 1: SOFTWARE REQUIREMENTS AND SPECIFICATIONS
Chairperson: Pei Hsia, University of Alabama
“LIFE CYCLE EVALUATION OF SYSTEM PARTITIONING,” J.L. Uhrig, Bell Laboratories
“INTRODUCING SOFTWARE BLUEPRINT,” Yaohan Chu, University of Maryland
“REQUIREMENT SPECIFICATION AND PRELIMINARY DESIGN FOR REAL-TIME SYSTEM,” Barton DeWolfe, Charles Stark Draper Laboratory, Inc.
SESSION 2: SOFTWARE DEVELOPMENT METHODOLOGY I
Chairperson: Herb Hecht, Aerospace Corporation
“VERIFICATION OF COMMERCIAL POWER-PLANT CONTROL AND PROTECTION SOFTWARE,” Myron Kayton, TRW
“ASTROS—ADVANCED SYSTEMATIC TECHNIQUES FOR RELIABLE OPERATIONAL SOFTWARE,” J.A. Salazar (SAMTEC, Vandenberg Air Force Base) and R.R. Hall (Federal Electric Corporation)
“VIKING '75—THE DEVELOPMENT OF A RELIABLE FLIGHT PROGRAM,” B.A. Calsussen, II, Martin Marietta
“INDEPENDENT VERIFICATION OF HIGHLY RELIABLE PROGRAMS,” M. Fuji, Logicon
SESSION 3: REAL-TIME APPLICATIONS
Chairperson: W. Ulrich, Bell Laboratories
“NO. 2 SWITCHING CONTROL CENTER SYSTEM—AN EXAMPLE OF REAL-TIME FEATURES IN AN INTERACTIVE SYSTEM,” C.W. Brown, Bell Laboratories
“NO. 1 AUTOMATIC MESSAGE ACCOUNTING RECORDING CENTER: SYSTEM DESCRIPTION AND SOFTWARE ORGANIZATION OF A MINICOMPUTER-BASED BILLING SYSTEM,” P.V. Lessak, Bell Laboratories
“TESTING SOFTWARE DESIGN MODELED BY FINITE STATE MACHINES,” T.S. Chow, Bell Laboratories
SESSION 4: MEDICAL INFORMATION SYSTEMS
Chairperson: S.K. Chang, University of Illinois at Chicago Circle
“LSI-11 MEDICAL INFORMATION MICROSYSTEM,” L.C. Kingsland, III, University of Missouri-Columbia
“A LOCAL NODE FOR A DEPOSITORY HEALTH COMPUTER NETWORK,” Thomas C. Chen, University of Illinois
“STRUCTURED DATABASE DECOMPOSITION IN THE MEDICAL INFORMATION SYSTEM ENVIRONMENT,” S.K. Chang and W.H. Chang, University of Illinois at Chicago Circle
SESSION 5: COMPUTER SCIENCE EDUCATION IN APPLICATION-ORIENTED AREAS
Chairperson: Lawrence Jehn, University of Dayton
“PERTINENT COMPUTER SCIENCE TOPICS FOR SCIENCE AND ENGINEERING STUDENTS,” Lawrence Jehn
“COMPUTER SCIENCE AND CHEMISTRY EDUCATION,” Ronald Collins, Eastern Michigan University
“DATA BASE INQUIRY IN SOCIAL SCIENCE,” Fred S. Halley, SUNY at Rockport
“EDUCATIONAL COMPUTING IN PSYCHOLOGY,” Arthur O. Cromer, University of Louisville

WEDNESDAY AFTERNOON (Parallel Sessions)
3:30 p.m. - 5:00 p.m.
SESSION 6: SOFTWARE APPLICATIONS
Chairperson: Dick Fairley, Colorado State University
“MODULAR PROGRAMMING IN PL/M,” William Brown, Intel Corporation
“INDEX STANDARD FOR FLOATING POINT ARITHMETIC,” John Palmer, Intel Corporation
“SPRINT — AN INTERACTIVE SYSTEM FOR PRINTED CIRCUIT BOARD DESIGN,” F. Mellor, W.J. Olden, and C.J. Bedard, Bell-Northern Research, Ottawa
SESSION 7: SOFTWARE DEVELOPMENT METHODOLOGY II
Chairperson: J.W. Johnson, Bell Laboratories
“SYSTEM CENTURY DIGITAL CENTRAL OFFICE CALL PROCESSING AND SOFTWARE STRUCTURE AND OPERATION,” John Woodward, Stromberg-Carlson
“SYSTEM CENTURY DIGITAL CENTRAL OFFICE NETWORK AND PREPROCESSOR CONTROL SOFTWARE,” R. Lanham and T. Vojir, Stromberg-Carlson
“SOFTWARE FOR DISTRIBUTED PROCESSOR CONTROLLED SWITCHING SYSTEM,” C.J. Hughes and J. Garrett, Post Office Research Centre, Ipswich, England
“SOME CHARACTERISTICS OF ELECTRONIC SWITCHING SYSTEM MAIN PROGRAM TASK SCHEDULING,” J.E. Grant, G.W. Richards, and J.C. Warner, Bell Laboratories
“STRUCTURED DESIGN OF ELECTRONIC SWITCHING SYSTEM SOFTWARE,” E. Iwabuchi, K. Soga, Y. Kawai, Fujitsu Corporation, Kawasaki, Japan
SESSION 8: REAL-TIME APPLICATIONS—ELECTRONIC SWITCHING SYSTEMS II
Chairperson: Herb Hecht, Aerospace Corporation
“SYSTEM CENTURY DIGITAL OFFICE CALL PROCESSING AND SOFTWARE STRUCTURE AND OPERATION,” John Woodward, Stromberg-Carlson
“SYSTEM CENTURY DIGITAL CENTRAL OFFICE NETWORK AND PREPROCESSOR CONTROL SOFTWARE,” R. Lanham and T. Vojir, Stromberg-Carlson
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“STRUCTURED DESIGN OF ELECTRONIC SWITCHING SYSTEM SOFTWARE,” E. Iwabuchi, K. Soga, Y. Kawai, Fujitsu Corporation, Kawasaki, Japan
SESSION 9: MEDICAL INFORMATION PROCESSING
Chairperson: R.S. Ledley, Georgetown University Medical Center
“AUTOMATED RECOGNITION AND CLASSIFICATION OF INDEPENDENT OBSERVATIONS CONTAINED IN MEDICAL DOCUMENTS,” E. Vacarri and W. Delaney, Istituto di Fisica, Italy
“AN APPROACH TO DATA VALIDATION FOR THE U1MC TUMOR REGISTRY SYSTEM,” S.K. Chang and L. Allen, University of Illinois at Chicago Circle
“COMPUTER ANALYSIS OF ELECTROCARDIOGRAMS,” R.A. Dunn and H.V. Pipberger, The George Washington University Medical Center
“COMPUTER-AIDED MEDICAL DIAGNOSIS: RHY3-P.3A CAUSAL MODEL OF THE DIAGNOSIS AND TREATMENT OF RENOVASCULAR HYPERTENSION,” K.H. Smith, Bell Laboratories
SESSION 10: COMPUTER SCIENCE AND ENGINEERING CURRICULA
Moderator: C.V. Ramamoorthy, University of California, Berkeley
Panelists: Gerald Engel, Virginia Institute of Marine Science
L.J. Henchel, Northwestern University
Mike Mulder, Bonneville Power Administration
Jim Snyder, University of Illinois
H. Trauboth, Institut für Datenverarbeitung in der Technik Institut, Germany
Keith Uncapher, University of Southern California

(continued on next page)
THURSDAY, November 10, 1977

THURSDAY MORNING (Parallel Sessions)
8:30 a.m. - 10:00 a.m.

SESSION 12: SOFTWARE LIFE CYCLE MODELING

"PROGRAMMING REQUIREMENTS," C. Walston, IBM
"SYSTEM LIFE CYCLE ESTIMATION(SLICE): A NEW APPROACH TO ESTIMATING RESOURCES FOR APPLICATION PROGRAM DEVELOPMENT," A.L. Kustanowitz, IBM
"ORGANIZATIONAL STRATEGIES FOR PRODUCING BETTER SOFTWARE," W.F. Sampson, T.J. Little, and G.C. Dodson, Jr., General Electric Company

SESSION 13: SOFTWARE DESIGN METHODOLOGY I
Chairperson: R.T. Yeh, University of Texas

"A SEMANTIC BASED REQUIREMENT AND DESIGN METHODOLOGY," A.B. Serrentino and Harlan Mills, IBM
"SOFTWARE ASPECTS OF A.I. SYSTEMS," Raj Reddy, CMU
"EXPERIENCE IN THE DESIGN OF DATA BASE SYSTEMS," Alan Merton, University of Michigan

SESSION 14: QUERY AND DATA INDEPENDENCE
Chairperson: Frank Manole, Naval Research Laboratory

"A METHODOLOGY FOR THE DESIGN OF GENERALIZED QUERY PROCESSORS FOR CODASYL DATABASES," D.R. Dolk and M.E. Loomis, University of Arizona
"RELATIONAL VIEWS IN A DATA BASE SYSTEM: SUPPORT FOR QUERIES," C. Zaniolo, Sperry Research Center
"A CANONICAL REPRESENTATION FOR THE RELATIONAL SCHEMA AND LOGICAL DATA INDEPENDENCE," E.A. Lewis, L.C. Sekino, and P.D. Ting, Bell Laboratories

SESSION 15: MEDICAL IMAGE PROCESSING SOFTWARE
Chairperson: Ken Preston, Jr., Carnegie-Mellon University

"AN IMAGE ANALYZING SOFTWARE SYSTEM FOR CYTOLOGY," R. Bartels, University of Arizona
"A SOFTWARE SYSTEM FOR HIGH-SPEED BLOOD CELL ANALYSIS," Ken Preston, Jr.
"RECONSTRUCTION SOFTWARE FOR COMPUTERIZED TOMOGRAPHY," J. Prewitt, National Institutes of Health
"SOFTWARE FOR THE AUTOMATIC ANALYSIS OF CHEST X-RAY IMAGES," H. Wechsler, Purdue University

SESSION 16: ADVANCES IN REAL-TIME COMPUTING I
Chairperson: N.F. Schneidewind, Naval Post-Graduate School, Monterey

"MODULARITY CONSIDERATIONS IN REAL-TIME OPERATING SYSTEM STRUCTURES," Uno Kodres, Naval Post-Graduate School, Monterey
"ANALYSIS OF REAL-TIME SYSTEM BY DATA FLOW GRAPHS," Lt. Commander Jeffrey Ackerson, Fleet Intelligence Center, Pearl Harbor
"COMPUTER-ASSISTED INTELLIGENCE GRAPHICS SUPPORT IN FLEET COMMAND CENTER," Thomas M. McCalla, Jr., Southern Illinois University

SESSION 17: SOFTWARE TESTING I
Chairperson: G.B. Hosler, U.S. Army Computer System Command

"SOFTWARE TESTING IN SUPPORT OF WORLDWIDE MILITARY COMMAND AND CONTROL SYSTEM ADP," James D. Painter, Defense Communications Agency
"SOFTWARE TEST MANAGEMENT," F.J. Multani, TRW
"AUTOMATED SOFTWARE CONTROL SYSTEM," R.J. Carey, Computer Science Corporation

SESSION 18: SOFTWARE DESIGN METHODOLOGY II
Chairperson: R.T. Yeh, University of Texas

"NETWORK: A MULTIPROCESSOR PROGRAM," P. Brinch-Hansen, University of Southern California

SESSION 20: IMAGE ANALYSIS AND GENERATION I
Chairperson: C.L. Coates, Purdue University

"A VIRTUAL MEMORY COMPUTER SYSTEM FOR IMAGE PROCESSING APPLICATIONS," A.E. Akers (Motorola), E. Persoon (Philips Research Laboratory, Eindhoven), and K.S. Fu (Purdue University)

SESSION 21: ADVANCES IN REAL-TIME COMPUTING II
Chairperson: N.F. Schneidewind, Naval Post-Graduate School, Monterey

"RELIABLE COMPUTER SYSTEM FOR STORAGE CONTROL IN A STEEL MILL," A. Jaeschke and Heinz Trauboth, Institut für Datenverarbeitung in der Technik Institut, Germany
"RESEARCH FLIGHT SOFTWARE ENGINEERING AND MUST - AN INTEGRATED SYSTEM OF SUPPORT TOOLS," Terry A. Stretzer, Edwin C. Foudriat, and Ralph W. Will, NASA Langley Research Center
"TEAM ARCHITECTURE REAL-TIME COMPUTING SYSTEM FOR GENERAL AVIATION," N.F. Schneidewind

THURSDAY AFTERNOON (Parallel Sessions)
1:30 p.m. - 3:00 p.m.

SESSION 22: SOFTWARE TESTING II
Chairperson: J. Darringer, IBM

"THE DETECTION OF UNEXPECTABLE PROGRAM PATHS THROUGH STATIC DATA FLOW ANALYSIS," L. Osterwiel, Boeing Computer Services
"A TEST CASE SELECTION METHOD FOR THE VALIDATION OF SOFTWARE MAINTENANCE MODIFICATION," Kurt F. Fischer, TRW
SESSION 23: SOFTWARE DESIGN AND TESTING TOOLS
Chairperson: D. Fife, National Bureau of Standards

"PERFORMANCE ANALYSIS AS A PRACTICAL SOFTWARE DESIGN TOOL," Thomas J. Gilkey, John R. White, and Taylor L. Booth, University of Connecticut

"A SOFTWARE TOOL FOR EVALUATING MODULE SPECIFICATIONS," D. Chester and R. Yeh, University of Texas

"RELIABILITY OF SYMBOLIC EVALUATION," W. Howden, University of California, San Diego

SESSION 24: OPERATING AND DATABASE SYSTEMS INTERFACES
Chairperson: H. Rex Hartson, Virginia Polytechnical and State University

"A NOTE ON VIRTUAL MEMORY INDEXES," Kurt Maly, University of Minnesota


"IMPLEMENTING ALERTING TECHNIQUES IN DATABASE SYSTEMS," O. P. Buneman and H. L. Morgan, University of Pennsylvania

SESSION 25: IMAGE ANALYSIS AND GENERATION II
Chairperson: Robert T. Chien, University of Illinois

"STRUCTURED MERGE STRATEGIES FOR IMAGE SEGMENTATION," R. A. Jarvis, Purdue University

"CODING AND MANIPULATING MAPS," J. J. Sendin and J. L. Navalon, IBM Scientific Center, Madrid

"TEXTURE ANALYSIS BY A SYNTACTIC APPROACH," S. Y. Lu (Syracuse University) and K. S. Fu (Purdue University)

SESSION 26: PROGRAMMING LANGUAGES
Chairperson: Dick Fairley, Colorado State University

"NON-PROCEDURAL COMPUTER PROGRAMMING WITH MODEL," S. Shastry, N. Prywes, and A. Pneuli, University of Pennsylvania

"ULANG — A GENERATOR FOR COMMANDS," I. F. Freibergs, Universite du Quebec a Montreal

"ON THE INPUT/OUTPUT MECHANISM IN CONCURRENT PASCAL," A. Silberschatz, University of Texas at Dallas

THURSDAY AFTERNOON (Parallel Sessions)
3:30 p.m. - 5:00 p.m.

SESSION 27: SOFTWARE MAINTENANCE
Chairperson: Y. R. Wang, Texas A & I University

"E-3A NAVIGATIONAL COMPUTER SYSTEM SOFTWARE MAINTENANCE PLANNING," W. Sharphey

"ISSUE: AN INFORMATION SYSTEM AND SOFTWARE UPDATE ENVIRONMENT," R. S. Kaplan, Bell Laboratories

"AUTOMATED CONTROL OF SOFTWARE MAINTENANCE," Robert Fink, U.S. Army Computer System Command, Fort Belvoir, Virginia

SESSION 28: MODULAR PROGRAM DESIGN
Chairperson: G. Lyon, National Bureau of Standards

"AN APPROACH TO THE ENGINEERING OF DATA PROCESSING PROGRAMS," S. A. Schuster (University of Toronto) and E. Arjomiandy (York University)

"AN OPTIMUM MODULE SIZE WITH RESPECT TO COMPIRAUTION COST," J. L. Elshoff, General Motors Research Laboratories

"ANALYZING THE MODULAR DESIGN OF FORTRAN PROGRAMS," Linda Self and Edward W. Davis, University of Florida

SESSION 29: DISTRIBUTED DATABASES
Chairperson: David K. Hsiao, Ohio State University

"DESIGN CONSIDERATIONS FOR DISTRIBUTED DATABASE SYSTEMS — A REVIEW," Prakash G. Hebalkar and C. Tung, IBM

"ANALYSIS OF SERIALIZABILITY IN SDD-1: A SYSTEM FOR DISTRIBUTED DATABASES," J. Rothnie, P. Bernstein, N. Goodman (Computer Corporation of America), and C. Papadimitrio (Harvard University)

"THE REDUNDANT UPDATE METHODOLOGY OF SDD-1: A SYSTEM FOR DISTRIBUTED DATABASES," J. Rothnie, N. Goodman, and P. Bernstein (Computer Corporation of America)

SESSION 30: COMPUTER CONTROL OF COMPLEX ENERGY SYSTEMS
Chairperson: A. C. M. Chen, General Electric Company

"SOME SALIENT FEATURES OF U.S. ELECTRIC POWER SYSTEMS," A. C. M. Chen

"CONTROL COMPUTER FOR ENERGY MANAGEMENT," J. J. Farzan, IBM

"COMPUTER CONTROL IN A COMBINED CYCLE POWER PLANT," R. Uram, Westinghouse Electric Corporation

"COMPUTER MONITORING OF BOILING WATER REACTORS," J. Shukla, General Electric Company

"SOFTWARE VALIDATION OF NUCLEAR REACTOR CONTROL OF COMPUTER SYSTEMS," A. Long, Electric Power Research Institute, Palo Alto

THURSDAY EVENING
5:30 p.m. COMPSAC COCKTAIL PARTY

FRIDAY, November 11, 1977

FRIDAY MORNNG (Parallel Sessions)
8:30 a.m. - 10:00 a.m.

SESSION 31: VERIFICATION AND VALIDATION
Chairperson: J. C. Huang, University of Houston

"AUTOMATED TECHNIQUES FOR STATIC STRUCTURAL VALIDATION OF PROGRAMS," W. T. Chen, S. T. Huang (National Tsing Hua University, Taiwan), and C. V. Ramamoorthy (University of California, Berkeley)

"MAJOR MILESTONES IN PROGRAM VERIFICATION," J. Misra and R. T. Yeh, University of Texas

"THE CORRECTNESS OF PROGRAMS WRITTEN IN THE LANGUAGE KL-1," T. Lindquist and R. F. Keller, Iowa State University

SESSION 32: SOFTWARE REQUIREMENTS ANALYSIS
Chairperson: J. L. Hancock, U.S. Army Computer Systems Command, Fort Belvoir, Virginia

"AUTOMATED SOFTWARE REQUIREMENTS VALIDATION," M. W. Ailford, C. G. Davis, and L. R. Marker, Army Support Facility, Huntsville, Alabama

"AUTOMATING THE SOFTWARE DESIGN PROCESS," M. Morganstern, Rutgers State University

"THE POLITICS OF SOFTWARE SYSTEMS DESIGN, OR WHAT HAPPENS WHEN SYSTEMS ANALYSIS DOESN'T WORK?" P. G. W. Keen (Stanford Graduate School of Business) and E. M. Gerson (Pragmatic Systems, Inc.)

SESSION 33: ADVANCED INFORMATION SYSTEMS
Chairperson: Dorian Punj, Index Systems Inc.

"AN APPROACH FOR COMMUNICATING WITH DATA BASES USING ENGLISH QUERIES," J. Kirby and R. L. Kashyap, Purdue University

"A NON-PROCEDURAL SELF-OPTIMIZING INFORMATION RETRIEVAL SYSTEM," A. B. Davis, and Leon E. Winslow, Wright State University

"ELECTRONIC FUND TRANSFER SYSTEMS," Dorian Punj

"ADVANCES IN MANUFACTURING AND DISTRIBUTION SYSTEMS," A. C. Crescenzi, Index Systems Inc.

SESSION 34: INFORMATION PROCESSING ALGORITHMS
Chairperson: Marvin Zelkowitz, University of Maryland and National Bureau of Standards

"A HEURISTIC MORPHOLOGICAL ANALYZER FOR NATURAL LANGUAGE UNDERSTANDING PROGRAMS," Nick Cercone, Simon Fraser University

"AN N LOG SINGLE PASS CLUSTERING ALGORITHML" R. E. Williamson, Informatics Inc.

(continued on next page)
SESSION 36: COMPUTER-ASSISTED MANAGEMENT DECISION-MAKING I
Chairperson: A.B. Whinston, Purdue University
"DEVELOPMENT OF A CORPORATE INFORMATION SYSTEM," J.M. Blin and E.T. Stroh, Northwestern University
"AN OVERVIEW OF DECISION SUPPORT SYSTEMS," W.D. Haseman, Carnegie-Mellon University
"DESIGN OF A COMPUTER-BASED DECISION SUPPORT SYSTEM," B. Konsynski and J. Nunamaker, University of Arizona

FRIDAY MORNING (Parallel Sessions)
10:30 a.m. - noon
SESSION 36: HOW IS SOFTWARE DEVELOPMENT REALLY DONE?
Moderator: Leon Stucki, Boeing Computer Services
Panelists: G. Schuler, McDonnell-Douglas
Terry Straeter, NASA Langley Research Lab.
D. Wagner, San Clemente Air Force Base
SESSION 37: TRANSPORTABLE SOFTWARE
Chairperson: John Stauchhammer, North Carolina State University
"STUDIES IN COBOL SOFTWARE TRANSPORTABILITY," Michael J. Smith, University of Florida
SESSION 38: COMPUTER NETWORK DESIGN, SECURITY, AND CONTROL
Chairperson: Wesley W. Chu, UCLA
"DISTRIBUTED CONTROL SCHEMES FOR MULTIPLE-COPIES FILE ACCESS IN A NETWORK ENVIRONMENT," Chin-Hwa Lee, Rejen Shastry (Syracuse University) and Richard Metzger (Rome Air Development Center)
"DESIGN OF A DISTRIBUTED DATA BASE FILE MANAGER FOR A MINICOMPUTER NETWORK," S.A. Mahamoud, J.S. Rioridan, and K.C. Toth, Carleton University
"COOPERATIVE AUTORIZATION IN COMPUTER SYSTEMS," N. Minsky, Rutgers State University
SESSION 39: SOFTWARE FOR IMAGE PROCESSING RECOGNITION
Moderator: Bruce H. Barnes, National Science Foundation
Panelists: B.R. Hunt, University of Arizona
R.G. Hamlet, University of Maryland
R.M. Haralick, University of Kansas
C.A. Harlow, University of Missouri-Columbia
H. Wechsler, Purdue University
A. Rosenfeld, University of Maryland
SESSION 40: COMPUTER-ASSISTED MANAGEMENT DECISION-MAKING II
Chairperson: J.M. Blin, Northwestern University
"SOME PERSPECTIVES ON COMPUTERIZED MANAGEMENT DECISION-MAKING SYSTEMS," M.S. Morton, Massachusetts Institute of Technology
"A THEORETICAL DESIGN FOR A DECISION SUPPORT SYSTEM," R. Bonczek, C. Holtsapple, and A. Whinston, Purdue University

FRIDAY AFTERNOON (Parallel Sessions)
1:30 p.m. - 3:00 p.m.
SESSION 41: MESSAGES, COMMUNICATIONS, AND NETWORKS
Chairperson: Holger Opderbeck, Telenet Communications Corporation
"DATAPAC SOFTWARE ARCHITECTURE," Ash Trivedi, I.M. Cunningham, and W.J. Older, Bell-Northern Research, Ottawa
"AN APPROACH TO THE DESCRIPTION OF COMMUNICATION PROTOCOLS," Avrum Itzkowitz, University of Illinois
"AN EVOLUTIONARY COMPUTER NETWORK FOR SPACECRAFT PAYLOAD OPERATIONS," Richard desJardins, NASA/Goddard Space Flight Center

"A MESSAGE-SWITCHED OPERATING SYSTEM FOR A MULTI-PROCESSOR," Older Bedard, F. Mellor, and C.J. Bedard, Bell Northern Research
SESSION 42: REQUIREMENTS ENGINEERING IN REAL-TIME SYSTEMS
Chairperson: Charles R. Vick, Ballistic Missile Defense Advanced Technology Center, Huntsville
"REQUIREMENTS, SOFTWARE ENGINEERING'S BIG HURDLE," Carl G. Davis and Charles R. Vick, Ballistic Missile Defense Advanced Technology Center, Huntsville
"SMART MEMORIES' ROLE IN REAL-TIME DATA PROCESSING," E. Hatt and P. Alexander, General Electric Corporation
"ADAPTIVE TECHNIQUES FOR REAL-TIME CONTROL," E.F. Balis, TRW
SESSION 43: DATA STRUCTURES IN APPLICATIONS
Chairperson: Moshe Zloof, IBM
"A MEMORY STRUCTURE OF EMPIRICAL DESIGN FOR QUESTION-ANSWERING," Abraham S. Ben David, Xerox Corporation
"DATA ENVIRONMENT FOR LABORATORY FILM ANALYSIS SYSTEM," Michael J. Potel and Richard E. Sayre, University of Chicago
"THE THEORY OF QUESTIONNAIRES WITH APPLICATIONS TO DATA MANAGEMENT," M.E. Stickney, Hughes Aircraft Corporation
SESSION 44: COMPUTER APPLICATIONS IN COMPUTERIZED TOMOGRAPHY
Chairperson: Charles A. Harlow, University of Missouri-Columbia
"AN OVERVIEW OF CT SYSTEMS," Charles A. Harlow and S.J. Dwyer, University of Missouri-Columbia
"CT APPLICATIONS IN RADIOLOGY," William Glenn, M.D., Long Beach Memorial Hospital
"COMPUTERIZED TOMOGRAPHY AND RADIATION THERAPY APPLICATIONS," Barry McCurdy, EMI Medical, Inc., Northbrook, Illinois
"COMPUTERIZED TOMOGRAPHY AND DISPLAY TECHNOLOGY," P.A. Quares, Pfizer Medical Systems, Columbia, Maryland
"COMPUTATIONAL PROBLEMS IN COMPUTERIZED TOMOGRAPHY," A.C.M. Chen, General Electric

Midcon '77
Electronic Show and Convention / November 8-10
O'Hare Exposition Ctr. / Hyatt Regency O'Hare, Chicago

Coinciding with COMPSAC 77 will be the first MIDCON electronic exposition and convention, November 8-10, 1977, at the O'Hare Exposition Center and the Hyatt Regency Hotel. COMPSAC attendees will receive complimentary tickets to MIDCON 77 and may wish to plan a visit to the event. Co-sponsored by the IEEE and the Electronic Representatives Association, MIDCON will feature 375 exhibit units, with one of the four product categories featuring MINI/MICRO COMPUTERS AND PERIPHERALS. The convention will feature 30 half-day technical sessions on such topics as automated software design tools; methods of diagnostic imaging in medicine; digital communications: hardware, analysis and design; architectural trends in micro-based computer systems; satellite based remote sensors for earth observations; and fault isolation of analog PCB's.

COMPLIMENTARY SHUTTLE BUS WILL BE PROVIDED BETWEEN COMPSAC CONFERENCE HOTEL AND MIDCON.
Complete and return this form (with your check made payable to COMPSAC 77) to:

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STUDENT DISCOUNT available for COMPSAC ONLY (Fee: $25). To receive a discount, students must be IEEE Student Members and must show membership card at the door.

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- Suites (Check rates with hotel)

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<tr>
<td>COMPSAC 77 Conference Proceedings</td>
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<td>$25.00</td>
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<tr>
<td>Software Design Techniques: A Tutorial</td>
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