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Instructors: Stan Siegel, William Bryan, Christopher Chadbourne, and Linn Klitzkie

Audience: Intended for the software buyer or user wanting to learn something about software and its disciplined development; also of interest to the software veteran looking for fresh insight into the nature of software and valuable suggestions for sharpening critical skills.

Course Description: Provides insight into the mechanics of software configuration management. Promotes understanding of what the application of SCM accomplishes and what are the principles governing its application. Presentation uses a simplified case study to illustrate principles in specific terms.

Stan Siegel is manager of product assurance at CTEC, Inc., of Falls Church, Virginia. In this capacity he applies software configuration management on a daily basis to a broad range of projects. He recently published a textbook on SCM. Siegel received his PhD from Rutgers University.

William Bryan, a senior staff member in the CTEC Product Assurance Department, is actively involved in the application of SCM and other product assurance disciplines. This activity includes detailed technical audits of software. He has 20 years experience in the computer industry. Bryan received a DSc in computer science from George Washington University.

Christopher Chadbourne, a staff member in the CTEC Product Assurance Department, participates in a variety of software product assurance activities. These activities include software audits and the preparation of software test procedures. Originally exposed to configuration management practice in the context of Navy hardware, he has most recently immersed himself in the theory and practice of software configuration management. He holds a BS from the University of Michigan.

Linn Klitzkie, a senior staff member in the CTEC Product Assurance Department, is extensively involved in the application of software product assurance disciplines. He has provided configuration management support to the National Weather Service and the David Taylor Naval Research Ship and Development Center. He was the on-site director of a two-year test of automated message handling on a Joint Service project. He has a BA from the University of Wisconsin.

Course Outline:

Introduction: establishes a working vocabulary for the tutorial

Configuration Identification: principles and mechanics • generalized approach • case study tailoring generalized approach to specific project needs

Configuration Control: principles and mechanics • concept • evolutionary and revolutionary change • documentation

Configuration Status Auditing: principles and mechanics • checklists and applications to the case study

Configuration Status Accounting: principles and mechanics • illustration through the case study

Putting It All Together: perspective • shifts attention from microscopic aspects to macroscopic considerations • interaction of four functions explored through use of case study

Instructor: Kenneth J. Thurbur

Audience: Intended for managers, programmers, system analysts, and other technical personnel interested in specifica-

Course Description: Emphasizes philosophy for development of a set of requirements and tradeoff techniques for providing insight into design compromise. Begins with a session describing philosophies for requirements analysis. Continues with two application-oriented sessions (one on available design support tools and one on important documented designs).

Kenneth J. Thurbur is a senior staff scientist at Sperry Univar. An author of several textbooks and over 50 technical papers, he is active in the fields of local networks, communication architectures, distributed processing systems, computer architecture, and techniques for requirement analysis. He is presently chairman of the Computer Society's Technical Committee on Computer Communications and is a Distinguished Victor of the Computer Society. He was previously employed by Honeywell and is currently a part-time faculty member of the Computer Science Department of the University of Minnesota. Thurbur received a PhD in electrical engineering from Montana State University in 1969. He is general editor of the Computer Science Series published by the Lexington Books Division of D. C. Heath.

Course Outline:

Basic Concepts and Philosophy: systems • design process • problem statements • requirements • attributes • tradeoffs • design goals • specifications • analysis versus synthesis • design strategies

Tools: finite state machines • graphs • stimulus-response sequences • input-process-output sequences • requirement nets • linear tradeoff nalysis

Case Studies: system/360 • system/370 PDP-11 • VAX-11 • operating system analysis • summary of state-of-the-art

Case Study: example problem • concluding remarks

Instructor: Victor R. Basili

Audience: Intended for software managers and software engineers.

Course Description: Presents a new quantitative approach to software management and software engineering. Focuses on attributes that can be managed quantitatively, covering both product-oriented and process-oriented attributes. Utilizes a large set of models with emphasis on those areas where quantitative management can give the greatest payoff.

Victor R. Basili is an associate professor at the University of Maryland at College Park. A consultant to several industrial organizations and government agencies, he has been active in the design and development of several software projects and is currently involved in the measurement and evaluation of software development at NASA's Goddard Space Flight Center. Basili received his PhD in computer science from the University of Texas at Austin in 1970.

Course Outline:

Introduction

Resource Models: programming measurement and estimation • an alternative to the Rayleigh curve model • software sizing • analyzing medium-scale software development

Changes and Errors: effects of programming factors on programming effort • human factors • evaluation by error analysis • software reliability measurement

Product Measures: complexity • iterative enhancement • commercial PL/1 programs • Akaria's debugging data • automatable measures of psychological complexity of software maintenance tasks

Data Collection: collection, validation, and analysis

Candlelight Dinner Playhouse

Wednesday, October 29, 1980, 6:00-11:00 p.m.

Travel from Palmer House to America's first dinner theatre, the Candlelight Playhouse, where you enjoy the musical, "Follies," which has won seven Tony Awards. Choose from five delicious entrees for a complete evening of elegant dining and the best in live award-winning musicals. Cost: $23.00 per person. Tickets can be ordered only with advance registration.
Instructors: William E. Riddle and Jack C. Wileden

Audience: Intended for software designers and project managers.

Course Description: Focuses on the techniques applicable to the design activities that occur prior to the actual coding of a software system. Explores generally applicable methods and techniques with participants carrying out a series of software design exercises.

William E. Riddle is manager of advanced software for Cray Laboratories in Boulder, Colorado. His general research interests concern design and analysis techniques useful during the development of complex, concurrent software systems. Most recently, his research has focused upon the delivery of high-quality environments. Dr. Riddle is a member of ACM and Sigma Xi, a former national lecturer for ACM, and current vice chair of SIGSOFT. Riddle received his PhD from Stanford University in 1973.

Jack C. Wileden is an assistant professor of computer and information science at the University of Massachusetts. His teaching experience spans all aspects of software and his research interests lie in the area of software reliability, encompassing issues in both the design and analysis of software systems. He is particularly interested in techniques for modeling dynamically structured parallel systems and the utility of such techniques in software design and analysis. Dr. Wileden is a member of ACM, IEEE and Sigma Xi, and is a former national lecturer for ACM. He received his PhD in 1978 from the University of Michigan.

Course Outline:

Introduction: software design • overview

The Design Phase: overall development process • modeling of systems during design • analysis components and analysis capabilities

Notational Capabilities: approaches to abstract software description • languages recently developed for abstract description • abstract description of sequential algorithms

Analysis Capabilities: analysis techniques • finite state testing • introduction to other techniques

Miscellaneous Topics: development environments • retrospective assessment of the environment based on the DQN language

Tours of Chicago

Chicago Sightseeing Company operates a variety of tours of Chicago's downtown, magnificent mile, and vicinity. The Palmer House is one of the official starting points of these tours, and the company has a reservation booth in the hotel's lobby.

COMPSAC Hosted Parties

COMPSAC 80 will host two cocktail parties — one on Wednesday, October 29, and the other on Thursday, October 30 — from 5:00 to 6:30 p.m. COMPSAC registration fee (except student registration fee) includes two complimentary drink tickets for each of the two parties.

Instructor: Anthony I. Wasserman

Audience: Intended for programmers and system developers interested in an overview of current programming language design, and for those interested in the issues underlying the recent proliferation of programming languages.

Course Description: Presents issues and goals of recent programming language design efforts. Surveys issues in control structures, data types, programming style, and other key topics. Incorporates examples from PASCAL, ADA, and other modern languages. Provides framework for understanding and use of new programming languages.

Anthony I. Wasserman is an associate professor of medical information science at the University of California, San Francisco, and a lecturer in the Computer Science Division at the University of California, Berkeley. His research interests include programming language design, programming methodology, data base management, computer science education, and applications to health care. He has been active in professional organizations, serving as chairman of ACM SIGSOFT, the special interest group on software engineering, an ACM national lecturer, and a member of numerous technical program committees. He is the author of over 40 technical papers and co-editor of Software Engineering Education — Needs and Objectives and Issues in Data Base Management. Wasserman received his PhD in computer sciences from the University of Wisconsin, Madison, and his AB in mathematics and physics from the University of California, Berkeley.

Course Outline:

Issues in Programming Language Design: programming and problem solving • goals • synthesis of language features

Overview of PASCAL and ADA: history and background • general language characteristics

Control Structures — Sequential: issues (sequential and concurrent) • the "goto" debate • iteration • nondeterministic control • parameter passing • recursion

Data Types and Variables: declarations • type checking • PASCAL and ADA data types • abstract data types

Control Structures — Concurrent: concept of a process • concurrency mechanisms

Programming Style: relationship to programming languages • testing and verification issues • readability of programs

Instructor: Lawrence H. Putnam

Audience: Intended for engineers at the MS level or business management analysis at the MBA level with quantitative background. Should have five or more years of professional experience. Desirable education: mathematics through second-year calculus, college undergraduate physics, probability and statistics, simple linear programming theory, managerial economics, managerial accounting, managerial finance, capital budgeting, and engineering economy.

Course Description: All software projects exhibit the elements of a life cycle behavior. The nature of this cycle will be reviewed, its characteristics developed and explained, and the dominant influence of time as the independent variable emphasized. The managerial practices necessary to effectively plan and control the software life cycle are clearly brought out in the context of answering the management questions: How long? How much will it cost? How many people? What's the risk? What are the tradeoffs?

Lawrence H. Putnam is president of Quantitative Software Management, Inc., a firm specializing in software cost estimating and life cycle management. He has had extensive experience in planning the quantitative aspects of software life cycle management including cost, schedule, and manpower determination for development and control of the process during operations and maintenance. Putnam recently worked for General Electric Company as manager of system technology. Prior to that, he was special assistant to the commander, U.S. Army Computer Systems Command; special assistant to the Assistant Secretary of the Navy, Financial Management; and special assistant to the director of Army automation. Putnam holds an MS in physics from the Naval Postgraduate School and a BS from the U.S. Military Academy.

Course Outline:

Evidence of the Software Life Cycle: the estimating and control problem • management needs • the Rayleigh shape • Nor- den's model at IBM • evidence of time-varying pattern • data scatter (noise) • parametric data (scatter and noise)

Phenomenology: black box model • analogs with gas behavior • diffusion • spread of an innovation • acceleration in chaos • feedback processes • narrow bend filters • Rayleigh scattering • productivity • difficulty • software equation • tradeoff law • time-sensitivity • proof of the algorithm — the Rome data

Case History: how to get the management numbers • manual solution • the automated solution

Sizing the System: PERT estimating to resolve uncertainty in determining how many source statements have to be written

Linear Programming: practical applications

Risk Analysis to Hedge Our Bets

Adapting to the Real System Behavior
SESSION 6: SOFTWARE MODELS (3:30–5:00)
Chairperson: R. Graffon, Office of Naval Research
CONTROL FLOW, DATA FLOW, AND PROGRAM COMPLEXITY — E. I. Oviedo: State Univ. of New York
MODELING OF THE SOFTWARE RELIABILITY GROWTH PROCESS — C. V. Ramamoorthy and F. B. Bastani: Univ. of California, Berkeley

SESSION 7: THE ROLE OF DATA DICTIONARY IN SYSTEM LIFE CYCLE (3:30–5:00)
Chairperson: H. C. Lefkovits, Alpha-Omega Group, Inc.
Panelists: S. Bidwell, Health Care Services Corp.; G. Gajnak, Arthur Anderson, Inc.; C. D. Vincent, GSG

SESSION 8: IMAGE PROCESSING II (3:30–5:00)
Chairperson: F. Hollister, Texas Instruments, Inc.
DARPA IMAGE UNDERSTANDING PROGRAM: AN OVERVIEW — L. E. Druffel: Defense Advanced Research Projects Agency
IMAGE PROCESSING AND SEGMENTATION USING HIERARCHICAL STRUCTURES — A. Rosenfeld: Univ. of Maryland
KNOWLEDGE STRUCTURING IN TASK-ORIENTED IMAGE DATA BASES — D. M. McKeown: Carnegie-Mellon Univ.

SESSION 9: THE CARE AND FEEDING OF SOFTWARE PROFESSIONALS (3:30–5:00)
Chairperson: D. Reifer, Software Management Consultants
Panelists: R. Bate, T. J. Munson, SDC; M. Musket, Southern California Edison; J. Stringer, Xerox; A. Stuart, U.S. Forest Service

COCKTAILS (5:00–6:30)

Evening

SESSION 10: THE BIRDS OF THE FEATHER IN INFORMATION RESOURCE DICTIONARY SYSTEM (1BIRDS) (7:30–9:00)
Chairperson: B. Leong-Hong, National Bureau of Standards
Panelists: H. C. Lefkovits, Alpha-Omega Group, Inc.; others TBA
Open Discussion

THURSDAY, October 30, 1980

Morning

SESSION 11: SOFTWARE REQUIREMENTS AND SPECIFICATIONS I (8:30–10:00)
Chairperson: C. Davis, Ballistic Missile Defense Advanced Technology Center
THE SYSTEM ANALYST AND SOFTWARE REQUIREMENTS SPECIFICATION — R. L. Chafin: Jet Propulsion Laboratory
TOWARD A METHODOLOGY FOR FUNCTIONAL SPECIFICATIONS — R. Morton: General Electric
A STRUCTURAL APPROACH TO SYSTEM REQUIREMENTS ANALYSIS OF INFORMATION SYSTEMS — K. Nakao, K. Haruna, N. Komoda, H. Kaji: Systems Development Laboratory, Japan
OPERATIONAL REQUIREMENTS ACCOMMODATION IN DISTRIBUTED SYSTEM DESIGN — S. W. Smoliar: General Research Corp.

SESSION 12: SOFTWARE DEVELOPMENT ENVIRONMENTS AND TOOLS (Part I — 8:30–10:00, Part II — 10:30–noon)
Chairperson: W. E. Riddle, Cray Labs
Panelists: S. Saib, GRC; P. Santoni: Naval Ordnance System Command; G. Estrin, Univ. of California, Los Angeles; A. Wasserman, Univ. of California, San Francisco
SOFTWARE DEVELOPMENT ENVIRONMENTS — W. E. Riddle: Cray Labs

SESSION 13: DISTRIBUTED DESIGN ISSUES (8:30–10:00)
Chairperson: C. R. Vick, Ballistic Missile Defense Advanced Technology Center
Panelists: M. Alford, TRW; W. Chu, Univ. of California, Los Angeles; R. Larson, SCl; H. J. Siegel, Purdue Univ.; D. Siewiorek, Carnegie—Mellon Univ.
SESSION 14: COST EFFECTIVE SOFTWARE DEVELOPMENT METHODOLOGIES (8:30–10:00)
Chairperson: M. Paige, Wang Laboratories
MAXIMIZE DESIGN EFFORT AND MINIMIZE PROGRAM FLOW COMPLEXITY TO MAXIMIZE SOFTWARE DEVELOPMENT PRODUCTIVITY — J. E. Gaffney, IBM
OBSERVATIONS ON USE OF SEVEN STRUCTURED PROGRAMMING TECHNIQUES — J. Mitchell, U.S. Army Institute for Research in Management
TRAINING PROGRAMMERS UNDER SIMULATED "LIVE" CONDITIONS — E. R. Dolen: Western Electric

SESSION 15: SOFTWARE PRODUCTIVITY (8:30–10:00)
Chairperson: R. Yeh, Univ. of Maryland
Panelists: V. Basil, Univ. of Maryland; L. Belady, IBM; C. Geise, AIRMICS; S. Jeffery, National Bureau of Standards; T. Straeter, General Dynamics; R. Wolverton, TRW

SESSION 16: SOFTWARE REQUIREMENTS AND SPECIFICATIONS II (10:30–noon)
Chairperson: T. Arnold, Bell Telephone Laboratories
A SOFTWARE TECHNIQUE FOR ENHANCING PERFORMANCE OF A DISTRIBUTED COMPUTER SYSTEM — C. Wu and T. Feng: Wright State Univ.
ON DESIGNING A SECURITY MANAGEMENT SYSTEM FOR DISTRIBUTED DATA BASES — U. Bussolati, G. Martella: Institute of Electrotechnology and Electronics Polytechnic, Italy

SESSION 17: DISTRIBUTED SYSTEMS I (10:30–noon)
Chairperson: T. L. Kuni, Univ. of Tokyo, Japan
SOFTWARE DIAGRAM DESCRIPTIONS: SDD AND ITS APPLICATION — Y. Kanda and M. Sugimoto: Fujitsu, Japan
DESIGN SYSTEMS FOR DESIGN EVOLUTION LOGICAL FRAMEWORK — T. L. Kuni and K. Yamaguchi: Univ. of Tokyo, Japan
EXTENSIBILITY AND ADAPTABILITY OF DISTRIBUTED SYSTEMS — M. Maekawa: Univ. of Tokyo, Japan
DATA BASE MANAGEMENT SYSTEM FOR ENGINEERING AND SCIENTIFIC COMPUTATIONAL TASKS — J. C. Browne, H. S. Kuni, K. Takahashi, O. Katayama, K. Oyanagi, L. Elliott, T. Liu, S. Y. Han, D. Gangopadhyay: Univ. of Texas; T. L. Kuni: Univ. of Tokyo, Japan

SESSION 18: EXPERIENCES IN DATA ABSTRACTIONS (10:30–noon)
Chairperson: A. Physter, Univ. of California, Santa Barbara
Panelists: B. Leavenworth, IBM; R. Meeson, General Research Corp.; J. Morris, Purdue Univ.; M. Zeikowitz, Univ. of Maryland

SESSION 22: DISTRIBUTED SYSTEMS II (1:30–3:00)
Chairperson: E. Swartzlander, TRW
PROTOCOL VALIDATION BY SYNTHESIZING COMMUNICATION SYSTEM BEHAVIORS — S. Y. Bang: Bell Laboratories; P. A. Ng and P. K. Blackwell: Univ. of Missouri
FAULT DIAGNOSIS OF DISTRIBUTED SYSTEMS — C. R. Kime, C. S. Holt, J. A. McPherson: Univ. of Wisconsin; Madison; J. E. Smith: CDC
INTERPROCESS COMMUNICATION SCHEMES SUPPORTING SYSTEM RECONFIGURATION — R. Y. Kan and W. R. Franta: Univ. of Minnesota
FAULT-TOLERANT RECONFIGURABLE MICROPROCESSOR SYSTEMS — V. P. Nelson: Auburn Univ.

SESSION 23: SOFTWARE QUALITY ASSURANCE (Part I — 1:30–3:00, Part II — 3:30–5:00)
Chairperson: E. Miller, Software Research Associates
SOFTWARE MAINTENANCE TECHNIQUES — J. Donahoo and D. Swearingen: Computer Science Corp.
MAINTENANCE: A KEY ELEMENT IN COMPUTER REQUIREMENTS DEFINITION — A. Conn: Univ. of Maryland
A MODERN FACILITY FOR SOFTWARE PRODUCTION AND MAINTENANCE — H. G. Stuebing: Naval Air Development Center

SESSION 24: SOFTWARE METHODOLOGIES (3:30–5:00)
Chairperson: B. Buckles, General Research Corp.
SOFTWARE DEVELOPMENT METHODOLOGY FOR REAL-TIME APPLICATIONS — D. R. Mott: Phantoms Research, Inc.
THE COMPUTER PROGRAM DEVELOPMENT PLAN — J. S. Black: TRW

SESSION 25: PROBLEMS AND RESEARCH DIRECTIONS IN PROGRAMMING Environments (3:30–5:00)
Chairperson: M. Branstad, National Bureau of Standards
Panelists: D. Brobow, Xerox; T. Cheatham, Harvard Univ.; T. Standish, Univ. of California, Irvine; M. Zeikowitz, Univ. of Maryland

SESSION 26: DISTRIBUTED DATA BASES (3:30–5:00)
Chairperson: W. W. Chu, Univ. of California, Los Angeles
DECENTRALIZED DYNAMIC QUERY DECOMPOSITION FOR DISTRIBUTED DATABASE SYSTEMS — N. G. Toan: IMAG, France
THE CASUAL GRAPH MODEL FOR DISTRIBUTED DATABASE SYNCHRONIZATION ALGORITHMS — B. Bhargava and C. T. Hua: Univ. of Pittsburgh
ON IDENTIFYING A CLASS OF DISTRIBUTED QUERIES THAT CAN BE PROCESSED EFFICIENTLY — M. Ozsoyoglu: Univ. of Alberta, Canada; C. T. Yu: Univ. of Illinois
AN EFFICIENT HEURISTIC FOR FILE PLACEMENT ON DISTRIBUTED DATABASES — B. W. Weh: Purdue Univ.

SESSION 27: SOFTWARE PROBLEMS OF ADAPTABLE ARCHITECTURES (3:30–5:00)
Chairperson: S. and L. Kartashev, Dynamic Computer Architecture, Inc.
SOME SOFTWARE ISSUES IN ADAPTABLE ARCHITECTURES — S. K. Mehra: Worchester Polytechnic Institute; J. C. Majthia: Univ. of Waterloo
UNIQUE SOFTWARE PROBLEMS FOR REARREANGEABLE NETWORK CONNECTED COMPUTER SYSTEMS — M. Malek: Univ. of Texas

SESSION 28: SOFTWARE PROBLEMS OF ADAPTABLE ARCHITECTURES (3:30–5:00)
Chairperson: S. and L. Kartashev, Dynamic Computer Architecture, Inc.
SOME SOFTWARE ISSUES IN ADAPTABLE ARCHITECTURES — S. K. Mehra: Worchester Polytechnic Institute; J. C. Majthia: Univ. of Waterloo
UNIQUE SOFTWARE PROBLEMS FOR REARREANGEABLE NETWORK CONNECTED COMPUTER SYSTEMS — M. Malek: Univ. of Texas

COCKTAILS (5:00–6:30)

(continued on next page)
Morning

SESSION 29: SOFTWARE METRICS (8:30–10:00)
Chairperson: J. Cherniavsky, State Univ. of New York at Stony Brook
SOME EXPERIMENTAL ESTIMATORS FOR DEVELOPMENTAL AND DELIVERED ERRORS IN SOFTWARE DEVELOPMENT PROJECTS — V. Schneider, Institute for Defense Analysis
A METRIC FOR SOFTWARE TEST PLANNING — M. Paige: Analytic Services Corp.
SESSION 30: SOFTWARE TOOLS (8:30–10:00)
Chairperson: D. Fife, National Bureau of Standards
DEVELOPMENT OF TOOLS FOR SELECTIVE PROGRAM ANALYSIS — J. Arthur: Univ. of Houston; J. Ramanathan: Ohio State Univ.
SOURCE CONTROL + TOOLS = STABLE SYSTEMS — E. Cristofor, T. A. Wendt, B. C. Wonsiewicz: Bell Laboratories
A DATABASE DESIGN TOOL FOR HIERARCHICAL DATABASES — H. Kondo, T. Yoshida, T. Kato, S. Suemitsu: Hitachi, Ltd., Japan
SYNTAX DIRECTED SYMBOLIC EXECUTION — M. Jazayeri: TRW; C. Ghezzi: Institute of Electro Technology and Electronics Polytech, Italy
SESSION 31: DATA BASE (8:30–10:00)
Chairperson: J. S. Cololfello, Arizona State Univ.
THE DESCRIPTION AND USAGE OF EVOLVING SCHEMAS — T. Wilson: Sperry Univac
A PROBABILISTIC APPROACH TO STORAGE COMPRESSION OF LARGE NATURAL LANGUAGE DATA BASES — C. Wang: U.S. Dept. of Justice
SESSION 32: A CASE STUDY EXPERIMENT IN DISTRIBUTED SIMULATION (8:30–10:00)
Chairperson: M. Mariani, TRW
DISTRIBUTED SIMULATION HOST: A DISTRIBUTION TESTBED — W. C. McDonald and H. O. Welch: System Development Corp.;
J. D. Reynolds: General Digital Corp.
SIMULATION SOFTWARE DEVELOPMENT FOR THE BMDATC DDP UNDERLAY EXPERIMENT — R. Hoffman, R. Smith, J. Ellis: TRW
A CONFIGURABLE TESTBED FOR DISTRIBUTED DATA PROCESSING EXPERIMENTS — P. Haia: Univ. of Alabama, Huntsville
SESSION 33: FAULT TOLERANCE IN SOFTWARE (8:30–10:00)
Chairperson: K. H. Kim, Univ. of South Florida
SOFTWARE DESIGN FOR FAULT TOLERANCE — H. Kopetz: Technical Univ. of Berlin, Federal Republic of Germany
PROCESS RECONFIGURATION AND RECOVERY IN FAULT-TOLERANT DISTRIBUTED SYSTEMS — M. Siefer: Universitat Karlsruhe, Federal Republic of Germany
ISSUES IN FAULT TOLERANT SOFTWARE FOR REAL-TIME CONTROL APPLICATIONS — H. Hecht: SoHaR, Inc.
SESSION 34: FAULT TOLERANCE/QUALITY ASSURANCE (10:30–noon)
Chairperson: J. Staudhammer, Univ. of Florida, Gainsville
ERROR RECOVERY IN CONCURRENT PROCESSES — K. Kant and A. Silberschatz: Univ. of Texas, Dallas
A MODEL FOR IMPLEMENTATION OF A PROGRAMMABLE TRANSPARENT SCHEME FOR COORDINATING CONCURRENT PROCESSES IN RECOVERY — K. H. Kim: Univ. of South Florida
APPLICATION OF A METHODOLOGY FOR THE DEVELOPMENT AND VALIDATION OF RELIABLE PROCESS CONTROL SOFTWARE — C. V. Ramamoorthy, F. B. Bastani, Y. R. Mok: Univ. of California, Berkeley
SESSION 35: EXPERIENCE WITH SOFTWARE TEST TOOLS (10:30–noon)
Chairperson: S. Saib, General Research Corp.
A DEBUGGING, TESTING, AND DOCUMENTATION TOOL FOR JOVIAL J73 — C. Gannon: General Research Corp.
DESIGN, IMPLEMENTATION, AND PRACTICE OF COBOL PROGRAM DYNAMIC ANALYZER IN VARIOUS ENVIRONMENTS — N. Fujimura and K. Ushijima: Kyushu Univ., Japan
EXPERIENCE WITH SOFTWARE TOOLS FOR NUCLEAR PROCESS SYSTEM APPLICATIONS — B. L. Dooley, H. L. Reeves, N. C. Thomas: Babcock Wilcox
SESSION 36: DATA BASE II (10:30–noon)
Chairperson: V. Lum, IBM Research Laboratory
THE APPLICATION OF DATA DEPENDENCY THEORY TO THE STUDY OF DATABASES — C. R. Carlson and G. K. Arora: Bell Laboratories;
M. M. Carlson: Northwestern Univ.
CONCEPTUAL MODELS FOR DATABASE SYSTEMS: BETWEEN REALITY AND REPRESENTATION — P. Scheuermann and S. Al-Fedaghi:
Northwestern Univ.
SESSION 37: LESSONS LEARNED FROM THE GALILEO PROJECT (10:30–noon)
Chairperson: D. J. Reifer, Software Management Consultants
FLIGHT SOFTWARE: NEW CHALLENGES AND APPROACHES — B. T. Larson: Jet Propulsion Lab
GALILEO FLIGHT SOFTWARE MANAGEMENT: THE SCIENCES MANAGEMENT — R. C. Barry: Jet Propulsion Lab; D. J. Reifer: Software Management Consultants
SAMS: ADDRESSING MANAGERS' NEEDS — P. M. Molko: Jet Propulsion Lab
SESSION 38: SPECIAL TOPICS (10:30–noon)
Chairperson: N. Marellos, Western Electric
MANAGING TECHNOLOGY TRANSFER FOR SOFTWARE DEVELOPMENT: THE PARADIGMATIC APPROACH — M. G. Walker: EDS
THE STRUCTURE OF AN ADVANCED VECTORIZER FOR PIPELINED PROCESSORS — D. J. Kuck, R. H. Kuhn, B. Leasure, M. Wolfe: Univ. of Illinois, Urbana
EXTERNAL SORTING USING GENERAL PURPOSE MAGNETIC BUBBLE MEMORY — W. E. Wright: Southern Illinois Univ. at Carbondale
PASCAL/HSD: A GRAPHICAL PROGRAMMING LANGUAGE — J. L. Diaz: Herrera and R. C. Flude: Univ. of Lancaster, UK
Afternoon

SESSION 39: MEASURING THE QUALITY OF SOFTWARE DESIGNS (1:30–3:00)
Chairperson: B. DeWolf, C. S. Draper Laboratory
SOFTWARE DESIGN TESTABILITY ANALYSIS — B. Yin: Ford Aerospace
THE MEASUREMENT OF CONTROL AND DATA FLOW COMPLEXITY IN SOFTWARE DESIGNS — M. Whitworth and P. Szulewski: C. S. Draper Laboratory
FIGURES OF MERIT FOR SOFTWARE QUALITY — V. Vemuri: State Univ. of New York at Binghamton
VOCABULARY EFFECTS IN SOFTWARE SCIENCE — G. Fitosos: IBM Corp.
SESSION 40: OPERATING SYSTEMS (1:30–3:00)
Chairperson: H. Lee, Northwestern Univ.
A CONCURRENT PASCAL OPERATING SYSTEM FOR A NETWORK COMPUTER — A. van Tilborg: State Univ. of New York at Buffalo
MANAGEMENT OF THE SOURCE TEXT OF A PORTABLE OPERATING SYSTEM — T. A. Cargill: Univ. of Waterloo, Canada
P. Fischer: Vanderbilt Univ.
SESSION 41: RELATIONAL DATABASES (1:30–3:00)
Chairperson: C. R. Carlson, Bell Laboratories
AN INDEXING TECHNIQUE FOR RELATIONAL DATABASES — F. Bonfatti, D. Malo, P. Tiberio: Institute of Electronics, University of Bologna, Italy;
M. Spadoni: Sogesta SpA, Italy
THE IMPLEMENTATION OF DYNAMIC DERIVED RELATIONS — V. Gharavi and J. Driscoll: Univ. of Central Florida
EXTENDED RELATIONAL CALCULUS: A FORMALISM FOR HIGH LEVEL RELATIONAL QUERY LANGUAGES — T. Pang and B. Liu: National Taiwan Univ., Taiwan
ON CONSISTENT AND COMPLETE DECLARATION OF DEPENDENCIES FOR RELATIONS — Bengt-Lundberg: Univ. of Lund, Sweden
SESSION 42: APPLICATIONS (1:30–3:00)
Chairperson: K. S. Fu, Purdue Univ.
A HIERARCHICALLY DISTRIBUTED ROBOT CONTROL SYSTEM — K. G. Shin and S. Malin: RPI
MEMO: AN APPLICATION OF SECRET KEY CRYPTOGRAPHY AND PUBLIC KEY DISTRIBUTION — S. A. Powers, B. P. Schanning, J. Kowalchuk: MITRE Corp.
EDIPS: AN EVENT-DESCRIPTION PROGRAMMING LANGUAGE FOR SIMULATION — T. Watanabe, Y. Ozawa, H. Hagaware: Kyoto Univ., Japan
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