Appendix 4

Teaching Assignments

Calendar Year 1989 Faculty and Graduate Teaching Assistant Assignments

I. Faculty Assignments and GTA Graders

A. Professor, Associate Professor, and Assistant Professor

	Teaching Assignment		Graduate Teaching Assistant
	Spring 1989	Fall 1989	
Virg Wallentine	CMPSC 690	CMPSC 690	Jim Butler
Bill Hankley	CMPSC 505(2)	CMPSC 636 CMPSC 671	Qian Huang (spring) Raghavendra Rao (fall)
Elizabeth Unger	CMPSC 560(2) CMPSC 990	CMPSC 761 CMPSC 762	Dennis Ng Sheela Ramanna
Myron Calhoun	CMPSC 305 CMPSC 362	CMPSC 305 CMPSC 362 CMPSC 580	Doug Varney (spring) Peikun Tsai Ramesh Tiwari
David Gustafson	CMPSC 541 CMPSC 740 CMPSC 940	CMPSC 535 CMPSC 540	Richard Courtney Kyung He An (spring) Eric Byrne
Dave Schmidt	CMPSC 806 CMPSC 990	CMPSC 700 CMPSC 705	Kyung Doh Pascal Fradet
Maarten vanSwaay	CMPSC 307 CMPSC 492 CMPSC 520	CMPSC 500(2) CMPSC 520	Tom Supawarnnapong (spring) Ganesan Sundar (spring) A. Banerjee (fall) Kasinath Vemulapalli (fall)
Maria Bleyberg	CMPSC 730	CMPSC 630	Rizwan Mithani (spring) Cindy Cook (fall)
Rodney Howell	CMPSC 675 CMPSC 990	CMPSC 770	Adrian Fiech
Masaaki Mizuno	CMPSC 620 CMPSC 725	CMPSC 920	Sudeep Dharan (spring)
K. Ravindran		CMPSC 825	S. Ramakrishnan (grant)

B. Instructor and Instructor-Temp.

	Teaching Assignment Spring 1989	Fall 1989	Graduate Teaching Assistant
Joseph Campbell	CMPSC 567 CMPSC 897	CMPSC 562 CMPSC 897	
Charles Kichler	CMPSC 110	CMPSC 110	
James Peters	CMPSC 370 CMPSC 591		
Clark Sexton	CMPSC 200 CMPSC 207	CMPSC 200 CMPSC 207	Li Fang Hsieh (spring) Eric Fong (fall)
Kole Scarbrough			Mini Supercomputer Admin

II. GTA Assigned as Classroom Teachers

Greg Knittel	CMPSC 110 (spring)
Kiang Pang	CMPSC 110
Jim Slack	CMPSC 200
David Balda	CMPSC 206 (spring)
Gary Wade	CMPSC 206 (spring)
Charles Black	CMPSC 206 (fall)
Ka Wing Wong	CMPSC 207
Hossein Saiedian	CMPSC 211 (spring)
Stan Robben	CMPSC 211 (spring)
Abdul Kasim	CMPSC 211 (fall)
Kevin Lynn	CMPSC 211 (fall)
Mohammad Paryavi	CMPSC 300
Mitchell Neilsen	CMPSC 370 (fall)
Paul Connelly	CMPSC 490 (fall)

III. Miscellaneous GTA Assignments

David Balda (fall,grd 20X)	Jeff Brogden (fall,systems)
Kok Hui Chong (spring,grd 20X)	Eric Fong (fall,grd 207)
Don Hager (spring,systems)	Amit Halder (grd 110)
Steve Hansen (coordinate 20X)	JR Hockersmith (fall,systems)
Abdul Kasim (spring,grd 20X)	Greg Knittel (fall,grd 110)
Janaki Krishnaswamy (grd 110)	Chris Li (spring,systems)
David Liu (fall,grd 20X)M.	Nelakonda (fall,grd 110)
James Peters (fall,grd 300)	Peter Prakash (spring,grd 110;fall systems)
Raghavendra Rao (spring,systems)	Paul Root (spring,systems)
S. Samdarshi (fall,grd 110)	Kole Scarbrough (spring,grd 725)
M. Venkatrao (fall,grd 110)	Kevin Weinhold (spring,grd 110)

Appendix 5

Committee Service

Maria Zamfir-Bleyberg

Recruiting Committee

Myron Calhoun

The "Service Courses" subcommittee of the "Undergraduate Studies" committee.

David Gustafson

Seminar committee
Undergraduate Studies
Faculty Evaluation
Faculty Search

William Hankley

Graduate Studies Committee
converting databases to Mac Excel screening of applicants manage prelim exams
Undergraduate Studies Committee
manage 2 yr curriculum & catalog changes College Laboratory Committee manage Mac lab spec & purchases

Rod Howell

Seminar Series Committee
Undergraduate Studies Committee - in charge of CIS 370 (570).

Austin Melton

None

Masaaki Mizuno

Faculty Recruiting Committee
Computing Facilities

K. Ravidran

None

David Schmidt

Graduate Studies Committee

Elizabeth Unger

A & S Deans Advisory Committee
Undergraduate Studies, Chair until August
Chair, Search Committee for KSU Vice Provost

Maarten van Swaay

UG curriculm

Virgil Wallentine

CIS Department

- Chair, Recruiting Committee
- Chair, Computing Facilities
- Faculty Evaluation
- Graduate Studies

A&S College

- Chair, College Committee on Planning
- Faculty Evaluation
- Chair, General Laboratory Committee

KSU

- Academic Computing Advisory Committee
  - -- Subcommittees
    - --- Co-chair, Ethics
    - --- Planning
    - --- Networking
- Telecommunications
  - -- Executive Council

Appendix 6
PUBLICATIONS

Accepted for Publication

Bleyberg, M., "AND/OR Algebraic Theories" (draft paper) presented at the 5th Workshop on the Mathematical Foundations of Programming Languages Semantics, Tulane University, March 1989.

Cabrera, M., and E. Unger, "Dynamic Data as a Deterrent to the Tracker," ACM SIGSMALL/PC 1990 Symposium.

Cheng, S., and V. Wallentine, "DEBL: A Knowledge-Based Language for Specifying and Debugging Distributed Programs. Presented at 1989 Computer Science Conference. Also appears in Communications of the ACM Vol. 32, No. 9, Sept, 1989.

Even, S. and D. Schmidt. ''Category Sorted Algebra-Based Action Semantics''. accepted for publication, Theoretical Computer Science.

Even, S. and D. Schmidt. ''Category Sorted Algebra-Based Action Semantics (extended abstract)''. Proc. Conf. on Algebraic Methodology and Software Technology, Iowa City, May 1989. acceptance rate about 20%

Even, S. and D. Schmidt. ''Type Inference for Action Semantics'' Submitted to 1990 European Symposium on Programming.

Even, S. and D. Schmidt. ''Category-Sorted Algebra Based Action Semantics'' Report TR-CS-89-9 Accepted by TCS as noted above.

Hansen, S. and E. A. Unger, " A Model for Computer Organisms", ACM/IEEE WAC 1989.

Haycock, A., and E. Unger, "Conflict free Multivalued Dependencies: A Guide to their Properties and Contibution to Database Schema Improvement," ACM South Central Regioanal Conference Proceedings, 1989.

Hines, M. and E. Unger, "OODB: an Overivew and Proposal for Exception Handling," ACM/IEEE WAC Proceedings, 1989.

Hines, M. and E. A. Unger, "A Conceptual Objected Oriented Database", ACM/IEEE WAC 1989.

Hines, T. and E. A. Unger, " Learning Lines of Codes Software Estimation by Example"' ACM/IEEE WAC 1989.

Howell, R., and L. Rosier, "Problems Concerning Fairness and Temporal Logic for Conflict-Free Petri Nets, Theoretical Computer Science 64 (1989), pp. 305-329.

Howell, R., Rosier, L., and H. Yen, "Normal and Sinkless Petri Nets", in the Proceedings of the 7th International Conference on Fundamentals of Computation Theory, LNCS 380, pp. 234-243, Szeged, Hungary, August 1989.

Howell, R., Rosier, L., and M. Gouda, "System Simulation and the Sensitivity of Self-Stabilization" in the Proceedings of the 14th International Symposium on Mathematical Foundations of Computer Science, LNCS 379, pp. 249-258, Porabka Kozubnik, Poland, August- September 1989.

Isenhour, T., Marshal, J.C., Zhou, T., and M. Bleyberg, "The Design and Implementation of an Analytical Chemistry Expert System" , 3rd International Conference on AI Applications in Engineering.

Lass, D. and D. Schmidt. ''Single-Threaded Combinator Definitions'' Report TR-CS-89-8 Submitted to Functional Prog. Lang. and Computer Architectures Conf.

McBride, R. A., K.W. Wong, J.F. Peters and E.A. Unger, "Rule Based Active Message Systems"., ACM/IEEE WAC March 1989.

McNulty, S., and E. Unger, "Information Disclosure and Data Aggregation", Interface Orlando 1989.

Melton, A., Shenoi, S., and L.T. Fan, "Functional Dependencies and Normal Forms in the Fuzzy Relational Database Model", Information Sciences.

Melton, A., and N. Fenton, "Deriving Software Measures Throughout the Development Process", The Journal of Systems and Software.

Melton, A., Baker, A., Bieman, J., Fenton, N., Gustafson, D., and R. Whitty. "A Philosophy and Goals of Software Measurement", The Journal of Systems and Software.

Mizuno, M., "A Least Fixed Point Approach to Inter-Procedural Information Flow Control" in Proc. of 12th National Computer Security Conference, 1989.

Mizuno, M., "An Iterative Method for Secure Inter-Procedural Information Flow Control" in Proc. of COMPSAC89, pp286-291, 1989.

Mizuno, M. and G. Sundar, "Distributed Algorithms for Multiple Mutual Exclusion based on Maekawa's sqrt(N) algorithm (EXTENDED ABSTRACT)" to appear in Proc. of International Phenix Conference on Computers and Communication, 1990.

Ramanna, S., Peters, J., and E. Unger, "Logic of Knowledge and Belief in The Design of a Distributed Integrity Kernel," Parabase-90 International Conference on Database, Parallel Architectures and their applications, 1990. Acceptance Rate 31%

Ravindran, K. and S. T. Chanson, "Failure Transparency in Remote Procedure Calls". IEEE Transactions on Computers, Vol. 38, No. 8, pp. 1173-1187, Aug. 89.

Ravindran, K. and S. T. Chanson and K. K. Ramakrishnan, "Reliable Client-Server Communication in Distributed Programs". 14th Conference on Local Computer Networks, Oct. 89.

Saiedian, H. and E. A. Unger, "An Actor Based Specification Language for Office Automation," ACM Computer Science Conference, 1989.

Saiedian, H., and E. Unger, "Formal Specification Tool for Distributed Office Systems," ACM SIGSMALL/PC Symposium 1990. Acceptance Rate 46%.

Saiedian, H., and E. Unger, "Design Principles of a Specification Methodology for Office Systems," ACM/IEEE SIGSMALL WAC Proceedings 1989.

Unger E. A., Samuel Hsieh, Maarten van Swaay, "A Concurrency Method: Prototype Implementation", ACM/IEEE WAC 1989.

van Swaay, M., and M. Lucas, "Resource Materials for a Process Control Laboratory, IEEE Educational Activities Board, 1989 "Measurement of Interrupt Response Time", IEEE 1989.

Vaughn, Rayford and Elizabeth A. Unger, "A Multilevel Approach to LAN_WAN Security," Proceedings of the Department of Energy Conference on Security, 1989.

Wong, K., and E. Unger, "Formal Analysis of Active Messages," ACM South Central Regional Conference Proceedings, 1989.

Wong, K. W. and E. A. Unger, "An Architecture for Active Messages Systems", ACM/ICCC WAC 1989.

Submissions

Bleyberg, M.,"On the Semantics of Petri Nets" submitted to the 5th Annual IEEE Symposium on Logic in Computer Science.

Bleyberg, M., "A Categorical View of Databases" submitted to ICALP 90.

Even, S. and D. Schmidt. ''Type Inference for Action Semantics'' Submitted to 1990 European Symposium on Programming.

Gustafson, D., Toledo, R., Courtney, R., and N. Temsamani, "A Critique of Validation/Verification Techniques for Software Development Measures".

Hagemann, C. and E.A. Unger, Lan: Small Group Decision Support System: Integration of Fuzzy Sets Teory in Multilevel Decision making, Submitted to the Decision Support Journal of the American Management Association.

Hagemann, C. and E. A.Unger, LAN SGDDS: Assisting in Semi-Structured Multilevel Decision Making Situations, Submitted to Decision Support Journal.

Howell, R., Rosier, L., and H. Yen, "A Taxonomy of Fairness and Temporal Logic Problems for Petri Nets" accepted for publication in Theoretical Computer Science.

Howell, R., Rosier, L., and H. Yen, "Global and Local Views of State Fairness" accepted for publication in Theoretical Computer Science.

Howell, R., Rosier, L. and M. Gouda,"The Instability of Self-Stabilization", submitted to Acta Informatica.

Howell, R., Rosier, L., and H. Yen, "Normal and Sinkless Petri Nets", submitted to Journal of Computer and System Sciences.

Hsieh, S., and E. Unger, "Information Flow Control: An Observational View, submitted to COMPASS 90.

Huang, Q., and D. Gustafson, "Evaluation of Data FLow Diagrams based on Fuzzy Sets". Submitted to the ACM South Central Regional Conference.

Liu, Y., and Wong, K. and E. Unger, "Active Message as a Model to Implement Office Procedures," submitted to ACM/IEEE WAC90.

Mata, R., and D. Gustafson, "A Factor Analysis of Complexity Measures". This is based on Ramon thesis. Submitted to Journal of Systems and Software in Sept 1989.

McNulty, S., McNulty, M., and D. Gustafson, "Stochastic Models for Software Science". Submitted to Journal of Systems and Software (Apr 89).

Melton, A., Gustafson, D., Bieman, J., and Albert Baker, "A Mathematical Perspective for Software Measures Research". Submitted to British Computer Society's Software Engineering Journal (Sept 89).

Melton, A., Baker, A., Bieman, J., and D. Gustafson. "A Mathematical Perspective for Software Measures Research", submitted to IEE Software Engineering Journal.

Melton, A., Shenoi, S., and L.T. Fan, "An Equivalent-Class Model of Fuzzy Relational Databases," The International Journal of Fuzzy Sets and Systems.

Mithani, R., and E. Unger, "An Object Oriented Environment for Distributed Database Systems,' submitted to OOPSLA.

Mizuno, M., and G. Sundar, "Distributed Algorithms for AND-Synchronization based on Maekawa's sprt(N) algorithm", submitted to IEEE Transactions on Parallel and Distributed Computing.

Mizuno, M., and M. Neilsen, "A Dag-Based Algorithm for Distributed Mutual Exclusion", submitted to ACM TOCS.

Mizuno, M. and R. Rao, "A Token Based Distributed Mutual Exclusion Algorithm based on sqrt(N) topology", submitted to IEEE Transactions on Computers.

Perng, J. and E. Unger, "User Friendly Front End fro an MPS Program," submitted to ACM/IEEE Symposium on Applied Computing 1990.

Peters, J., and W. Hankley, "Temporal Specification of Ada Tasks", for Jan 1990 Hawaii Conf on System Sciences.

Peters, J., and W. Hankley, "A Proof Method for Ada/TL Specifications", for March 1990, 8th Conf on Ada Technology, Washington, DC.

Ramanna, S., Peters, J. and E. Unger, "Temporal Specification of Integrity Kernels for Office Systems," submitted to ACM-SIGOS/IEEE COIS90 Conference on Office Information Systems.

Ramanna, S., and E. Unger, "Logic of Knowledge and Belief in the Design of a Office Information System Integrity Kernel," submitted to the International Office Systems Conference.

Ranft, S., and D. Gustafson, "Evaluating Projects with the Software Process Model". Submitted to CompSac 90.

Ravindran, K., "Fine-Grained Dynamic Reconfiguation of Servers in Distributed Operating Systems". Submitted for publication in IEEE Trasactions on Parallel and Distributed Computing, October 1989.

Ravindran, K., "Tradeoffs Between Complexity and Efieciency of Distributed Application Protocols". Submitted for publication in IEEE Transactions on Computers, January 1990.

Ravindran, K., "Evaluation of Reliability of Remote Procedure Calls in Distributed Programs". Submitted for publication in IEEE Transactions on Reliablity, February 1990.

Unger, E. A. , Sallie Keller-McNulty, and Nanda Kaushik,"An Economical Deterrent to Compromise of a Statistical Database', prepared for the NIST/NCSC Conference.

Varney, D., and E. Unger, "Malicious Code Detection using Attribute Grammars prepared for submission to the NIST/NCSC Security and Integrity conference.

Vaughn, R. and E. A. Unger, "A Security Architecture for Office Information Systems", submitted to ACM TOOIS Nov 1989.

In Progress

Al-Ali, K., and David A. Gustafson, "A Mathematical Foundation for Testability".

Bleyberg, M., and C. Cook, "CER* - An Object-Oriented Database Management System Prototype" TR-CS-89-15.

Butler, J. and V. Wallentine, " Vignettes: A Visual Queuing Network Simulation Language".

Butler, J. and V. Wallentine, "Load Equalization in Time-Ways Simulation". Gustafson, D., and Austin C. Melton, "Change Analysis for the Management of Software Development and Maintenance".

Gustafson, D., Al-Ali, K., An, K., Byrne, E., and A. Haycock, "Testing Strategies based on Reduced Paths".

Gustafson, D., "A Philosophy and Goals for Software Measurement".

Gustafson, D., CIS TR 89-02 is "A Critique of Validation/Verification Techniques for Software Development Measures"

Howell, R., Baruah, S., and L. Rosier, "On Preemptive Scheduling of Periodic, Real-Time Tasks on One Processor" in preparation.

Howell, R., Gouda, M. and L. Rosier, "The Instability of Self-Stabilization", Technical Report TR-CS-89-3, Dept. of Computing and Information Sciences, Kansas State University.

Huang, Q., and David A. Gustafson, "A Formal Notation for Data Flow Diagrams".

Lass, D., and D. Schmidt. ''Single-Threaded Combinator Definitions'' Report TR-CS-89-8.

Melton, A., Strecker, G., and P. Sestoft, "Lagois Connections and Computer Science Applications", Acta Informatica or Theoretical Computer Science.

Melton, A., and H. Dybkjaer, "Lambda Calculus, Hagino's Categorical Language, and Martin-Lof's Type Theory", Theoretical Computer Science.

Melton, A., and S. Shenoi. "The Role of Contexts in Abstract Information Storage and Retrieval".

Melton, A., and S. Shenoi. "Restricted Domain Partitioning". IEEE Trans. on Data and Knowledge Engineering or IEEE Trans. on Systems, Man, and Cybernetics.

Melton, A., "Topological Spaces for Cpos, Lecture Notes in Computer Science", 393, Springer-Verlag, 1989, pp. 302-314.

Mizuno, M., Neilsen, M. and K. Pang, "A Generalized Token Based Distributed Mutual Exclusion Algorithms for AND-Synchronization", in progress.

Mizuno, M. and A. Oldehoeft, "Information Flow Control for modular programming systems", preparing for the second submission to ACM TOPLAS (or some other journal).

Unger, E., "Semantic Modelling as an Approach to the Data Aggregation Problem," in preparation for the National Security Conference.

Appendix 7

Grants/Proposal

Awarded/Active

Maria Zamfir-Bleyberg

National Science Foundation Grant ($281,000) funded for "ANALYTICAL DIRECTOR - An Artificial Intelligence/Robotic Expert System for the Analytical Laboratory", with Professor Isenhour (principal investigator).

A KSU CRCCA ($20,000) grant to purchase KEE and develop an object-oriented database prototype based on my theoretical results.

A KSU CRCCA ($6,000) grant to investigate concurrency control in database systems.

A KSU CRCCA ($1,200) grant to take a course on neural nets at UCLA extension.

David Gustafson and Austin Melton

NATO Travel Grant 0343/88 ($6,000) "Formal Foundations of Software Measurement". NATO Collaborative Research Grant 034/88 expired this year. Applied for a one year extension for travel to two research meetings for the Grubstake Group.

Austin Melton

ONR Grant N00014-88-K-0455 running through Sept 91 ($225,963)

Masaaki Mizuno

The Center for Research and Computer Controlled Automation #FY89N003, funded for Summer, 1989. ($346)

The Center for Research and Computer Controlled Automation #90NO18, with Dr. K. Ravindran. ($8,484.00)

Listed as a senior associate in proposal "Semantics-Driven Compiler Synthesis" (NFS May 1, 1989 - April 30, 1991) by Dr. David A. Schmidt.

K. Ravindran

Obtained seed funding from "CRCCA" for research on multiservice ISDN's. ($8,484.00)

David Schmidt

'Semantics-Directed Compiler Synthesis', NSF, $158,000, 2 years.

Virgil Wallentine

'AT&T Summer-on-Campus' Graduate Program ($162,864).

SCS-40 Super mini-computer to support Parallel Computing Research ($700,000).

Pending

K. Ravindran

'A Data-Driven Communications Architecture for Distributed Operating Systems', $70,000, NSF.

Elizabeth Unger

NCSC Data Security Grant ranked to #2 behind Carnegie-Mellon Talked to them Dec 20 and they still think we will be funded in early 1990. They had appropriations pulled form their grant program so no grants have been funded since October.

Appendix 8

Current Research Programs of the CIS Faculty

Research in this department can be categorized in five basic areas - programming languages, software engineering, knowledge engineering, data base systems, and parallel and distributed systems. In this section we list the current specifc research projects of the CIS faculty.

Maria Zamfir, Ph.D., UCLA. Her research interests include different but interacting areas: the initial algebra semantics of parallel distributed computing, neural networks, and formal semantic models for the design of databases and knowledge-based systems.

In the area of parallel computing, her goal is to develop a language for writing and testing formal specifications of parallel distributed systems based on the AND/OR net model. The AND/OR net model is an initial algebra semantics model for concurrent computing systems, which I have been working at for the past few years. I have also been examining Petri nets as object-oriented systems in which abstract data types provide values for attributes. I have been using this view of Petri nets to define an abstract operational semantics for them based on "reflection". Finally, I hope that the study of neural networks will open new directions in my research in the area of parallel computing.

Regarding databases and knowledge-based systems, she is interested in building practical systems with appropriate logical foundations. At present, she is involved in the design and implementation of an expert system that can design and simulate an analytical chemistry procedure and controls the robot during the procedure execution. Regarding databases, she has been working at the implementation of an object-oriented database. This implementation is based on a formal categorical model of databases, which I have developed.

Myron A. Calhoun, Ph.D., Arizona State. Trying to delve deeply into the uses of Finite Inductive Sequences (FIS) as described by Fisher & Case. FIS appears to be directly applicable to the compression of textual data as well as compressing, processing, and recognizing visual images; this latter may also include applications in mobile free-ranging robotics. His ongoing (but now mostly backgróund) research emphasizes the application of computers to real-world problems such as the development of computer interfaces for the handicapped and low-cost packet-radio networks."

David A. Gustafson, Ph.D., Wisconsin-Madison. His research interests are in the area of software engineering. He is formalizing the theory of software measures so that it becomes obvious what is being measured and what propoerties the measure has. He is also doing research into the problems of validating software measures. Another area of research is software reliability. He is currently investigating models of the software structure that can be used to develop a software reliability model. Related to the area of reliability is the area of software testing methods. He is developing more thorough test methods that have formal bases. Another area in which he is involved is the area of formal notations for diagrams, both data flow diagrams and hierarchy diagrams. The creation of better notations will allow more formal work on transformations of the diagrams. Finally, he is working on developing notations for describing the software development process in terms of the documents that are produced.

Rodney Howell, PhD, University of Texas at Austin. His research interests lie mainly in three areas: real-time scheduling, self-stabilization, and Petri nets. In the area of real-time scheduling, he has been looking at the complexity of finding valid schedules for various types of periodic real-time systems. In many cases, the problems turn out to be NP-hard. His goal is to identify as many situations as possible in which schedules can be constructed efficiently. Regarding self-stabilization, he is interested in examining various theoretical limitations for self-stabilizing systems. For example, he has

recently explored situations in which certain types of models cannot simulate other types of models while preserving self-stabilization. Finally, in the area of Petri nets, he has been examining the computational complexity of various problems, such as reachability, boundedness, equivalence, liveness, and fair nontermination, for different classes of Petri nets. His main goal in this area of research is to tighten the known bounds on the complexity of the reachability problem for Petri nets.

William J. Hankley, Ph.D., Ohio State University. His research centers on formal specification of programs. Writing formal specifications is a kind of programming; it is the use of very high level nonprocedural languages. The research focus is on object-oriented and modular structure (using ADA concepts), high level data types (sets, maps, sequences as in VDM), logic specifications (predicate calculus and Prolog notations), and temporal description of task behaviors (temporal logic). Related work includes formal verification of specified system properties, development of executable specifications as program prototypes, and use of direct manipulation interfaces for rapid development of prototypes.

Austin Melton, Ph.D., Kansas State University. His research interests include programming semantics, software engineering, and nonnormal form relational databases. In programming semantics he is interested in using category theory to understand and explain programming semantics, and further he is interested in seeing how category theory itself can be used as a programming language. In software engineering he works with software measures or metrics. His work involves trying to develop a foundation upon which one can with confidence design and define useful software measures. In databases he is working to define a general method for defining and studying non-normal forms structures.

Masaaki Mizuno, Ph.D., Iowa State University. Research interests are in computer security and various aspects of distributed systems. He has worked on an information flow control mechanism for modular programming systems. He also works with Dr. David A. Schmidt on theoretical aspects of information flow by applying methodology in programming semantics. In his research in distributed systems, he and his students have developed efficient distributed mutual exclusion algorithms and distributed AND-synchronization algorithms. Currently, his group is studying concurrency control and recovery issues of transaction based distributed database systems.

K. Ravindran, Ph.D., British Columbia. Currently pursuing research on distributed systems architectures and high speed packet networks. Specific areas being investigated are: (i) Data-driven communication in distributed operating systems to allow fine-grained reconfigurability of services and fine-grained parallelism among functions that compose a server; (ii) Design of a flexible communication kernel for distributed applications whereby different applications may choose different forms of communication mechanisms to suit their requirements; (iii) Network architectures and protocols to handle congestion control, bandwidth management and packet multicasting in high speed packet switching.

David Schmidt, Ph.D., Pursuing research on the theory of programming languages as it is expressed within denotational semantics. He uses denotational semantics to analyze the structure of programming languages and to implement them. In past research, he has shown how to synthesize efficient implementation data structures for languages defined by denotational semantics. He and a research student are building a "rapid prototying," compiler synthesis system based on these ideas.

Recently, he has studied the category-theoretic foundations of languages with polymorphic operators within a denotational semantics variant called "action semantics." He and a student have developed a sound and complete type inference algorithm for action semantics; the algorithm is being implemented as part of a programming language analysis "workbench."

Elizabeth Unger, Ph.D., University of Kansas. The entire thrust of her research program is in the development of security and integrity systems based upon the object oriented programming paradigm. The

work proceeds with two foci: description of the general inference problem and characterization of the database administrator and user level integrity constraints. The first thrust includes the completion and documentation of the value of natural change for deterrent value on the tracker attacks; the mathematical and statistical characterization of the security value of such change; the security value of change in conjunction with other deterrent methods; the characterization of information increment given a user data increment. This latter characterization is just beginning with Shannon's concept of entropy as the basis for measurement. Such a measure will allow the use of a semantic model to characterize statistically the security risk of releasing data in certain risk environments. The second thrust is concerned with the formal description of one aspect of user level integrity, the temporality. In this thrust, a next step is the clear definition of user level integrity, the specification of a language in which to spedify contraints (to be used in the security project also) and the definition of the architecture of such a system within contemporary operating systems.

Maarten van Swaay, Ph.D., Leiden (Netherlands). Interests in laboratory instrumentation and in neural network systems. He has written a chapter on laboratory computing for a handbook on chemical instrumentation; the book is scheduled for publication in March 1990. In addition to technical areas Dr. van Swaay has a strong interest in social and ethical issues of computing, and has developed a course in that area in our department.

Virgil Wallentine, Ph.D., Iowa State University. Research includes distributed systems and their applications. More specifically, his work centers on what can be distributed, how it can be distributed across multiple processing units, and what properties of the system make it amenable to distribution. Presently, he is working in the area of Parallel and Distributed Discrete Event Simulation and in methods for debugging distributed programs. Several specific projects are on-going including the construction of a system which supports a visual programming facility for queueing networks, a performance prediction environment for DDES, and a knowledge-based debugging system for distributed programs.

Appendix 9

Professional Service

Maria Zamfir-Bleyberg

Refereeing for TCS (AMAST special issue):
"Higher-Order Polymorphic Equational Deduction with Function Constraints" by Zhenyu Qian

Refereeing for IEEE, TSE:
"Deriving Temporal Logic Formulae from Predicate Transition Nets" by X. He and J. A. N. Lee.

Refereeing for NSF (Division of Information, Robotics, and Intelligent Systems):
"Grammar and Relations" by Leo Mark.

Reviewing for AMAST:
"Constructor Models as Abstract Data Types (ADTs)" by Hantao Zhang
"An Extension to the Algebraic Specification Mechanism for ADTs by Hassan Mathkour
"An Algebraic Approach for Knowledge Integration" by Z. Chen
"Algebraic Structure of Petri Nets and Nondeterminism" by David B. Benson, Raju R. Iyer
"OBJSA Nets: OBJ2 and Petri nets for Specifying Concurrent Systems" by E. Battiston, F. DeCindio, G. Mauri
"Algebraic Specifications of ADTs and the Assessment of Ultra-Reliability" by Keith Miller, Robert Noonan, Steve Park
"An Algebraic Structure for Development of AI Systems" by Rong Lin
"An Image Processing Software Development: A Polynomial Algebra Approach" by Prabir Bhattacharya, Kai Qian
"An Example of IDAL Specifications" by Magne Haveraaen
"Formal Semantics of Two-tiered Specifications" by David Guaspari
"The Verification of Algebraically Specified Abstract Data Types using Higher -Order logic" by Phillip J. Windley

Myron Calhoun

Chairman of the "PC Applications for Developing Nations" sub- committee of TC/PC, the IEEE Technical Committee on Personal Computers.

David Gustafson

Refereed for the following:
IEEE Software - special issue on SLC Measures
IEEE Software - special issue on Software Maintenance
Conf on Software Maintenance 1989
ACM South Central Regional Conference
Hawaii Inter Conf on System Sciences

William Hankley

Reviewer for ACM Computing Reviews
Reviewer for Hawaii System Sciences Conference
Reviewer for IEEE Trans Soft Engr

Rod Howell

Refereed for Real-Time Systems and Fundamenta Informaticae.

Austin Melton

Referee for:
- IEEE Software Engineering Journal
- Mathematical Foundation of Programming Semantics Workshop

Masaaki Mizuno

Referee for:
- IEEE Computer
- ACM Simposium on Personal and Small Computers

K. Ravidran

Refereed papers for:
- IEEE Computer
- IEEE Trans on Computers
- IEEE Conference on Fault-Tolerant Computing

David Schmidt

Refereeing:
- Algebraic Methodology Conf.
- ACM TOPLAS
- Intl. J. of Parallel Programming
- 1989 IFIP World Computer Congress
- NSF
- Tenure review for NC Charlotte
- Theoretical Computer Science

Elizabeth Unger

Reviewer for:
- ACM CSE 1989
- ACM CSC 1989
- ACM Sigsmall/PC 1990
- ACM/IEEE WAC 1989 1990 and session chair
- ACM/IEEE South Central Regional Conference and session chair
- Scott Foresman
- ACM Computing Reviews
- Addison Wesley
- Times Mirror Mosby
- Little Brown
- Prentice Hall

Appendix 10
Faculty Presentations

Maria Zamfir-Bleyberg

"AND/OR Algebraic Theories" presented at the 5th Workshop on the Mathematical Foundations of Programming Language Semantics, Tulane University, March 1989.

Myron Calhoun None

David Gustafson

None

William Hankley

None

Rod Howell

I gave a presentation, "System Simulation and the Sensitivity of Self-Stabilization," as a colloquium here, October 26, 1989, and as an invited talk at Iowa State University, November 9, 1989.

Austin Melton

Category Theory and Computer Science (Manchester, England, September).
University of Tulsa in February ("Software Measures")
University of Darmstadt in July ("Eine Kategorie von Galois- Verbindungen")
University of Aarhus, Denmark in November ("A New Connection").

Masaaki Mizuno

Department research seminar "Distributed mutual exclusion algorithms", 11/30/89

K. Ravindran

None

David Schmidt

Algebraic Methodology and Software Technology Conf., Iowa City, May
INRIA, Rocquencourt, June
Univ. of Rennes/IRISA, France, June
University of Copenhagen, June
Univ. of Glasgow, July
Univ. of Edinburgh, July
Colorado State Univ., Nov
Oregon Graduate Institute, Beaverton, OR, Nov
Tektronix Labs, Beaverton, OR, Nov

Elizabeth Unger

INTERFACE between Computing and Statistics given in Orlando Florida in April on the Information Disclosure Problem and its relationship to the Data Aggregation Problem.

Research Seminar given to the Department of Computer Science at University or Missouri at Kansas City on the Data Aggregation Problem.

Invited Address to INTERFACE Conference April 1989.

Maarten van Swaay

Ethical Computing, DECUS.

Virgil Wallentine

"Computing Research at KSU" at Silicon Prairie Assn, Kansas City, KS.
"Essential 8 Departments in Arts & Sciences", Arts & Sciences seminars.
"Computer Viruses", Scholarship Day.

Consultant: Louisiana Board of Regents on Computer Education in the entire school system in Louisiana

Maarten van Swaay

Applied Computing Workshop
DECUS Natl Symposium

Virgil Wallentine

Refereed for:
IEEE Software
ACM SIGSMALL/PC 1990
Scott Foresman
ACM/IEEE WAC 1990

KSU Dept. of Computing and Information Sciences Departmental Network