

CONTENTS

Session 1A: Knowledge Database I

1. Knowledge-Based Integrity Constraint Validation X. Qian and G. Wiederhold 3
2. Checking Consistency of Database Constraints: A Logical Basis F. Bry and R. Manthey 13
3. Adaptive Predicate Managers in Database Systems S. Böttcher, M. Jarke and J. W. Schmidt 21

Session 2A: Knowledge Database II

1. LDL: A Logic-Based Data Language S. Tsur and C. Zaniolo 33
2. Optimizing the Rule-Data Interface in a KMS C. Kellogg, A. O'Hare and L. Travis 42
3. Retrieval-By-Unification Operation on a Relational Knowledge Base
..... Y. Morita, H. Yokota, K. Nishida and H. Itoh 52

Session 3A: Historical Database Applications

1. Historical Multi-Media Databases M. Adiba and N. B. Quang 63
2. Using History Information to Process Delayed Database Updates
..... S. K. Sarin, C. W. Kaufman and J. E. Somers 71
3. Temporal Data Management A. Shoshani and K. Kawagoe 79

Session 1B: Complex Objects

1. Object and File Management in the EXODUS Extensible Database System
..... M. J. Carey, D. J. DeWitt, J. E. Richardson and E. J. Shekita 91
2. Implementation Techniques of Complex Objects P. Valduriez, S. Khoshafian and G. Copeland 101
3. Managing Text as Data G. Pavlovic-Lazetic and E. Wong 111

Session 2B: Query Processing I

1. Estimating Block Accesses When Attributes Are Correlated
..... B. T. Vander Zanden, H. M. Taylor and Dina Bitton 119
2. Optimization of Nonrecursive Queries R. Krishnamurthy, H. Boral and C. Zaniolo 128
3. Translating Aggregate Queries into Iterative Programs J. C. Freytag and N. Goodman 138

Session 3B: Query Processing II

1. R* Optimizer Validation and Performance Evaluation for Distributed Queries
..... L. F. Mackert and G. M. Lohman 149
2. Simple Random Sampling from Relational Databases F. Olken and D. Rotem 160
3. Completeness Information and Its Application to Query Processing A. Motro 170

Session 4A: Relational Operation Optimization

1. The Idea of De-Clustering and Its Applications M. T. Fang, R. C. T. Lee and C. C. Chang 181
2. A Superjoin Algorithm for Deductive Databases J. A. Thom, K. Ramamohanarao and L. Naish 189
3. A Study of Sort Algorithms for Multiprocessor Database Machines J. Menon 197

Session 5A: Database Machines

1. An Overview of the System Software of a Parallel Relational Database Machine GRACE
..... S. Fushimi, M. Kitsuregawa and H. Tanaka 209
2. A Reliable Parallel Backend Using Multiattribute Clustering and Select-Join Operator
..... J. P. Cheiney, P. Faudemay, R. Michel and J. M. Thévenin 220
3. GAMMA - A High Performance Dataflow Database Machine D. J. DeWitt, R. H. Gerber,
G. Graefe, M. L. Heytens, K. B. Kumar and M. Muralikrishna 228

Session 6A: Concurrency and Distributed Systems

1. Concurrent Operations in Extendible Hashing M. Hsu and W.-P. Yang 241
2. The Management of Dynamically Distributed Database Windows Q. Chen 248
3. On Affinity Based Routing in Multi-System Data Sharing
..... P. S. Yu, D. W. Cornell, D. M. Dias and B. R. Iyer 249

Session 7A: Extended Data Models

1. ECRINS/86: An Extended Entity-Relationship Data Base Management System and Its Semantic
Query Language M. Junet, G. Falquet and M. Leonard 259
2. An Extended Relational Database System and It's Application to Management of Logic Diagrams
..... Y. Udagawa and T. Mizoguchi 267
3. Designing a Generalized NF² Model with an SQL-Type Language Interface P. Pistor and F. Andersen 278

Session 4B: Physical Database Structures and Performance

1. An Observation on Database Buffering Performance Metrics R. B. Hagmann 289
2. A Study of Index Structures for Main Memory Database Management Systems
..... T. J. Lehman and M. J. Carey 294
3. Transposition Algorithms on Very Large Compressed Databases H. K. T. Wong and J. Z. Li 304

Panel Session I: Knowledge Bases and Database Engineering

- D. S. Parker, Jr. 315

Session 6B: Generalized Data Model and Version

1. A General Model for Version Management in Databases P. Klahold, G. Schlageter and W. Wilkes 319
2. Toward a General Spatial Data Model for an Object-Oriented DBMS F. Manola and J. A. Orenstein 328
3. A Unifying Framework for Version Control in a CAD Environment H.-T. Chou and W. Kim 336

Session 7B: Case Studies

1. Framework for the Security Component of an Ada DBMS
..... D. Spooner, A. M. Keller, G. Wiederhold, J. Salasin and D. Heystek 347
2. Preliminary Design of ADMS±: A Workstation-Mainframe Integrated Architecture for Database Management Systems N. Roussopoulos and H. Kang 355
3. The REMIT System for Paraphrasing Relational Query Expressions into Natural Language
..... B. C. T. Lowden and A. N. De Roeck 365

Session 8A: Knowledge Database III

1. Relation Data Model with Cause-Effect Association Q. Yao and Y. Rong 375
2. On Analogical Query Processing in Logic Database T. Yokomori 376
3. Multiple Query Processing in Deductive Databases Using Query Graphs
..... U. S. Chakravarthy and J. Minker 384

Session 9A: Recursive Query Processing

1. Translation and Optimization of Logic Queries: The Algebraic Approach
..... S. Ceri, G. Gottlob and L. Lavazza 395
2. On the Computation of the Transitive Closure of Relational Operators Y. E. Ioannidis 403
3. A Parallel Processing Strategy for Evaluating Recursive Queries L. Raschid and S. Y. W. Su 412

Special Session I: Advanced Database Project (Invited)

1. Towards DBMS's for Supporting New Applications, S. Abiteboul, M. Scholl, G. Gardarin and E. Simon 423
2. Database Research at MCC E. Lowenthal 436
3. Research and Development on Knowledge Base Systems at ICOT H. Itoh 437

Session 8B: Issues in Database Design

1. On the Properties of Extended Inclusion Dependencies H. Arisawa and T. Miura 449
2. Updating Derived Relations: Detecting Irrelevant and Autonomously Computable Updates
..... J. A. Blakeley, N. Coburn and P. A. Larson 457
3. Choosing a View Update Translator by Dialog at View Definition Time A. M. Keller 467

Panel Session II: Anyone for a VLDB in the Year 2000?

- S. M. Deen 477

Special Session II: Japanese VLDB (Invited)

1. Computer and Communication System Development among Financial Institutions in Japan
..... T. Kurokawa 481
2. A Very Large Database System to Serve National Welfare M. Mori, K. Suzuki, H. Abe and K. Itoh 496
3. New Seat Reservation System for Japanese National Railways—Distributed Processing Network and High Efficiency Databases— E. Seki 502

- Author Index 511