

PROCEEDINGS of the  
**TWENTIETH HAWAII  
INTERNATIONAL CONFERENCE  
ON  
SYSTEM SCIENCES**

**1987**

**Vol.1**



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ORIGINAL PAGE IS  
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**TWENTIETH HAWAII  
INTERNATIONAL CONFERENCE  
ON  
SYSTEM SCIENCES  
1987**



**VOLUME I**

**ARCHITECTURE  
DECISION SUPPORT SYSTEMS AND  
KNOWLEDGE-BASED SYSTEMS**

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## **PREFACE TO THE PROCEEDINGS**

This volume is one of three that comprise the Proceedings of the Twentieth Hawaii International Conference on System Sciences (HICSS) held in Kailua-Kona, Hawaii on January 6-9, 1987. The conference is an annual presentation of refereed papers in the information and system sciences to provide a forum for the interchange of ideas, advances and applications among the academicians and practitioners. HICSS is sponsored by the University of Hawaii and the University of SW Louisiana, in cooperation with the ACM, and the IEEE Computer Society Technical Committee on Computational Medicine. The Twentieth conference emphasized developments in the areas of software, architecture, decision support systems and knowledge-based systems, healthcare systems, and special topics. Our most sincere thanks to all those paper presenters, attendees, coordinators, chairpersons, referees, and administrative support people who made the conference a success.

Bruce D. Shriver  
Ralph H. Sprague, Jr.  
Conference Co-Chairmen

**Volume I:     ARCHITECTURE, DECISION SUPPORT SYSTEMS  
                 AND KNOWLEDGE-BASED SYSTEMS**

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             Lee W. Hoevel  
             Yaohan Chu  
             Leonard Haynes  
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**Volume II:    SOFTWARE**

Editor:     Bruce D. Shriver

**Volume III:   HEALTHCARE SYSTEMS, SPECIAL TOPICS**

Editors:    Ralph R. Grams  
              Ralph H. Sprague, Jr.

The Hawaii International Conference on System Sciences (HICSS) is sponsored by:

University of Hawaii at Manoa  
University of SW Louisiana

in cooperation with:

Association for Computing Machinery (ACM)  
Institute of Electrical and Electronics Engineers (IEEE) Computer Society  
Technical Committee on Computational Medicine  
Technical Committee on Microprogramming  
Technical Committee on Computers and the Handicapped

## ACKNOWLEDGEMENTS

It takes the work of many people to organize and present a conference. In addition to the program committee and logistics support personnel, special thanks go to the referees who carefully but promptly reviewed each submitted paper prior to acceptance.

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The quality of the papers published in the Proceedings of HICSS is the result of many hours of careful review by independent referees. We acknowledge and thank the following people for serving as referees for the Twentieth Annual Hawaii International Conference on System Sciences.

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ARCHITECTURE TRACK  
HICSS-20

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The Architecture Track received and reviewed over ninety papers for HICSS-20. Submissions were of unusually high quality, which made the final selection process quite difficult. Many promising papers had to be rejected to meet space and time constraints. Session chairs and reviewers deserve special mention for their efforts in this activity.

Seven sessions of six papers each emerged from the review process. Sessions one and two deal with the effects of basic technology on architecture. Session three addresses the influence of concurrency on hardware, software, and architecture. Session four continues this theme, and also covers selected conceptual topics. Sessions five and six address various approaches to high-level architecture and machines. The seventh session covers the same general areas of technology, concurrency, and concepts, but within the context of non-standard machines and artificial intelligence.

This represents an intentional broadening of the Architecture Track to cover hardware, system, and conceptual issues in addition to instruction set architectures. The distribution of papers over categories, sessions and topics is representative of all submissions to the Architecture Track this year, not of just the accepted papers -- and indicates, by extension, the broader activities in universities and industry. There is an astonishing degree of life left in this field, which is too often consigned to the list of solved problems following the introduction of new processor or systems architectures. Evidently the socialization of industry-standard architectures into "open systems" assembled from platform processors and operating systems stimulates, rather than stifles, architectural creativity.



## ARCHITECTURE TRACK

### HICSS-20

### REFEREES

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