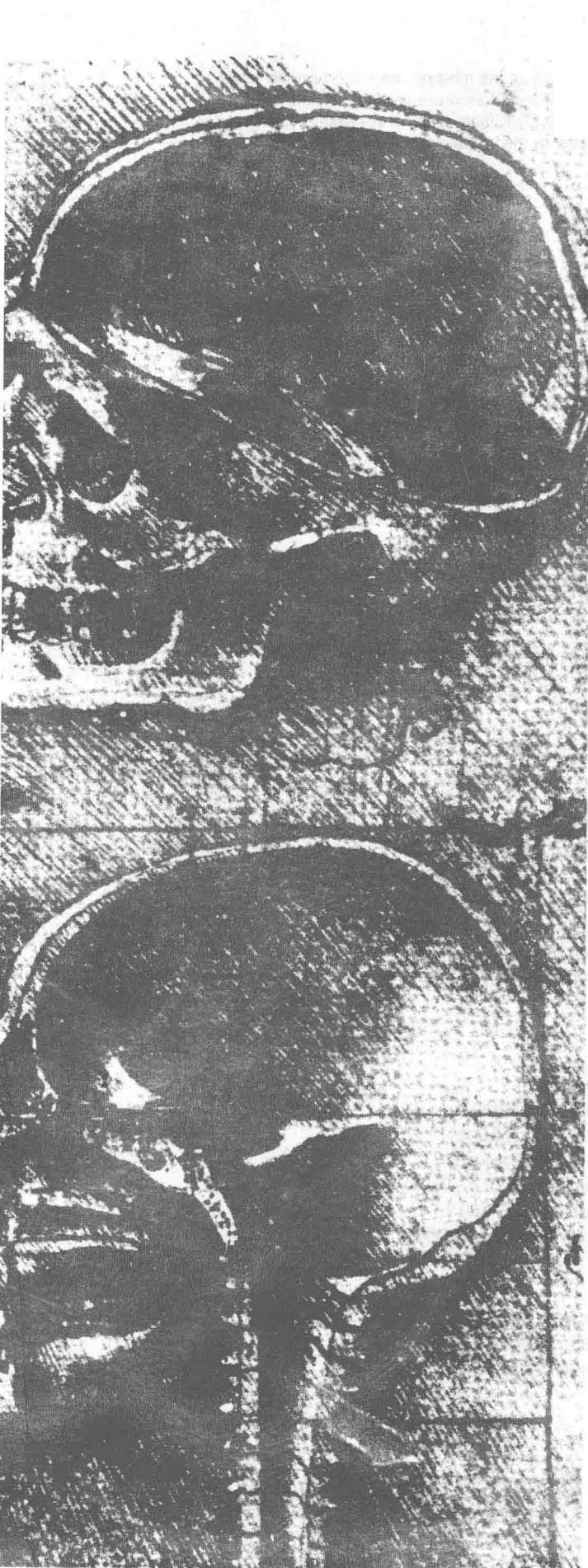


The Ninth Annual Symposium on
**COMPUTER APPLICATIONS
IN MEDICAL CARE**



PROCEEDINGS

The Ninth Annual Symposium on

COMPUTER APPLICATIONS IN MEDICAL CARE

*November 10—November 13, 1985
Baltimore, MD*

Edited by
Michael J. Ackerman, Ph.D.
Program Chairman

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THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

Preface

Welcome to the 9th Annual Symposium on Computer Applications in Medical Care! Your participation in this exchange of knowledge and ideas may be by presentations at the Symposium, attendance at the sessions and events, or by perusing this volume at a later time. Some of you are new to SCAMC, others have watched SCAMC grow from a small group who held a local meeting nine years ago to its current national and international status as the prime annual meeting in the field.

SCAMC's success is clearly not due to its membership—for it has none. Let me take a moment to discuss how this Symposium has been able to grow and flourish.

First, SCAMC's evolution could not have happened without the sponsorship and cooperation of 90 organizations and institutions — odds are that you are affiliated with at least one of these — and without the time and enthusiasm that many of you have donated to create each successive year's Symposium.

The nucleus group which initiated SCAMC raised seed money for the first several Symposia from sponsoring nonprofit organizations and institutions, with the hope that the proceeds of the year's meeting would permit each contributor to have this advance returned. This shared method of financing the Symposium may have contributed to the spirit of cooperation and joint purpose that has been a hallmark of each year's event. Any rivalries between professional organizations and societies have traditionally been set aside at SCAMC.

SCAMC's sponsoring and cooperating organizations no longer are asked for seed money — SCAMC has been financially successful and is now self-supporting. Other meetings in the field — including the now well established AAMSI Congress on the West Coast and the upcoming MEDINFO 86—have been supported by SCAMC in recent years to carry on the tradition that started SCAMC. And starting this year, as you will see in the Program, a number of entire SCAMC sessions are being conducted by sponsoring organizations or institutions.

Clearly, SCAMC's sponsoring organizations and institutions have continued to provide it with broad professional support from the disciplines that make up this field. Without these groups and their members, SCAMC could not have grown and flourished as it has. Their contributions to SCAMC have enabled a rich return of intellectual exchange to occur over the last nine years. I thank them for all they have done, and know that SCAMC will continue to work with them in the full spirit of cooperation that is our joint tradition.

When the size of SCAMC dictated that a more formal stewardship over the meeting was needed, a nonprofit educational corporation, the Symposium for Computer Applications in Medical Care, Inc., was chartered in 1980. This organization provides the stability and continuity needed for producing this annual event. Its Board of Directors, numbering about 20 members, are selected from the many leaders in the field at an annual election; its members serve staggered three-year terms without pay. Without their contributions and wisdom, SCAMC would not have been able to thrive. All of those who have so generously donated of their time on behalf of SCAMC and the field deserve far more thanks than I can give them here.

Each annual symposium represents uncountable hours of time contributed by those preparing the papers and tutorial sessions, reviewing the many excellent submissions, and serving on the committees needed to produce the scientific program. This year's Program Chairman, Dr. Michael Ackerman, has produced an outstanding intellectual feast for you, and I cannot say enough to thank him and his team for all of their work.

George Washington University Medical Center has played several roles in SCAMC's growth and evolution. During its formative years, SCAMC owed much of its stability to the managerial contributions of GWUMC's Office of Continuing Medical Education. Its Director, Dr. Thomas Piemme, helped form SCAMC, Inc. and served initially on its Board. When this Board approved a five-year contract with GWUMC-OCME to manage the annual meeting, he left the Board to become SCAMC's Executive Director. Tom and his staff have done an absolutely masterful job in managing all of the many activities necessary to produce this annual event, and I am sure that I speak for you in thanking them for their commitment to excellence in putting on this meeting.

Next year will be SCAMC's 10th anniversary, and as if to mark this event, the 10th SCAMC will be held in conjunction with MEDINFO 86—a major international meeting held only once every 3 years. Because of the unique circumstances next year, SCAMC will depart from its usual format, and will emphasize tutorial and invited sessions reviewing both the evolution and the current state of the art. The MEDINFO meeting which follows will contain contributed papers and special sessions from around the world. We hope you will be present in Washington for this historic event.

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Introduction

The Symposium on Computer Applications in Medical Care (SCAMC) was founded on the concept of sharing practical, computerized solutions to problems in health care delivery. The first symposium, held nine years ago, was largely attended by engineers and health care professionals who were committed to the application of computer technology to health care delivery. Most participants came from university hospitals or research centers. They used either their institutional mainframes or their laboratory minicomputers. Very few believed then that in a matter of years they would have a powerful, user-friendly, full-featured computer sitting on their desks. The revolution in computer hardware has made possible dramatic advances in the field of Medical Informatics. It is no longer necessary to have specialized computer knowledge or training to be part of this evolving field.

Just as the field of Medical Informatics has evolved during the past nine years, so has the SCAMC Board of Directors. This board evolved from a few local leaders to a board of 21 directors from all over the United States. The program presented at the 9th SCAMC was organized with their guidance and reflects the Board's resolve to maintain the highest level of excellence possible. We have tried to present a program that represents the current state of the art in Medical Informatics. It is a balanced program, with something for the newcomer as well as something for the leader in the field.

I am proud to announce that the Journal of Computer Methods and Instrumentation in Biomedicine has agreed to publish a special issue consisting solely of papers representative of the 9th SCAMC. As an added bonus to our Annual Student Paper Competition, they have agreed to publish the papers submitted by the top five finalists.

I would like to thank all the people without whose help this Symposium would not be possible: the Area Chairs, who acted as the final reviewers, made the tough decision to accept or reject a submission, put together the individual sessions, and coordinated them so as to minimize conflicts between sessions being presented at the same time; the reviewers, who read the submissions and made constructive comments so as to aid the authors in making improvements; and most important, the authors, without whose submissions and cooperation there could be no Symposium. I would like to make it a point to thank all who submitted papers, and truly regret that we had to reject so many fine submissions in order to hold the program to a manageable size. The members of the SCAMC Secretariat are to be commended. I have served my term as Program Chair and can now relax, but these people are already laying the groundwork for next year's Symposium and are switching gears in order to compliment the management style of the next Program Chair. The time and effort required by these people to present this Symposium every year is tremendous. Special thanks goes to our Arrangements Coordinator, Greg Thomas, and our Symposium Coordinator, Gail Mutnik.

I would like to give special thanks to my family, Judy, Lorrie, and Jeremy, for their ideas, encouragement, and patience. But most of all I would like to thank you, the reader. You are the Symposium. Without your participation and support there would be no SCAMC.

Michael J. Ackerman, Ph.D.
Program Chair

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