



SIGDA NEWSLETTER

SPECIAL INTEREST COMMITTEE ON DESIGN AUTOMATION

Vol. 1, No. 1

January 1971

Message From Your Chairman

Is SIGDA for real? I feel that a large percentage of the membership (83 out of around 200) has shown that it is.

In a letter dated June 10, 1970, Jean Sammet as Chairman of ACM Committee on SIG's and SIC's sent each of us a letter concerning the impending dissolution of SIGDA. Robert Hitchcock of IBM Research tried to reverse the trend by organizing a meeting of interested SIGDA members (and some non-members) at the 1970 DA Workshop in San Francisco. The result was that a list of interested people and potential candidates was generated. The SIGDA Nominating Committee, under chairmanship of J. B. O'Neill, met and increased this list of interested volunteers by four additional people. You received the list of eight candidates, and a whopping 40% of you voted. I don't know on what basis you made your choice, but I do know that we had eight interested and talented people running. And as you can see from my list of appointments, I am making good use of them.

To put first things first, I consider the most important item on the agenda to be one of communication with the membership. Our only means of achieving this at the present time is through a newsletter. I have appointed an Editorial Board headed by Walter Samek, whose interests lie in the area of Mechanical DA. Jerry Paskusz, who is active in theory of design and educational courses in design and DA, has agreed to be associate editor. As a third member of the board I have asked Larry Margol, whose interests lie in the long established DA area of electronics and computer design, and who is also your Vice Chairman. The Editorial Board is broad not only in geography but also in disciplines. My intent is not just to cover the geography of ACM, but also the disciplines affected by the increasing use of DA.

Although our first issue is small and meets only a few of the objectives which we think a Newsletter should serve, it is a start. In 1971 we plan to publish at least 3 issues. To a large extent our plans depend upon your interests; that is why I am including a survey in this initial newsletter. I'll leave it up to Walt to give you the pitch on some of the plans and objectives of the SIGDA Newsletter.

Charles E. Radke
SIGDA Chairman

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Present SIGDA Organization

Executive Committee:

Charles E. Radke - IBM, Poughkeepsie, New York - Chairman

Lawrence Margol - Microdesign, Anaheim, California - Vice Chairman

John Hanne - Texas Instruments, Dallas, Texas - Secretary/Treasurer

Editorial Board

Walter Samek - Combustion Engineering, Windsor, Connecticut - Editor

Gerhard Paskusz - University of Houston, Houston, Texas - Associate Editor

Lawrence Margol - Executive Committee Representative

Official Representative of SIGDA on 1971 Design Automation Workshop Committee -
C. E. Radke

Editor's Note

A new administration is taking office at SIGDA, consisting of a Chairman, a Vice Chairman, and a Secretary-Treasurer. The election, which brought these people into office, produced the following tally:

For Chairman:

Charles E. Radke..... 33 votes
 Gerhard F. Paskusz..... 29 votes
 Walter J. Samek..... 21 votes

For Vice-Chairman:

Lawrence Margol..... 37 votes
 Stephen P. Krosner..... 25 votes
 Marco Somalvico..... 21 votes

For Secretary-Treasurer:

John R. Hanne..... 44 votes
 Stephen A. Szygenda..... 39 votes

Therefore Radke and Margol have it by plurality and Hanne by majority.

As his first act as newly elected chairman Chuck Radke has appointed his defeated rivals Editor and Associate Editor of the SIGDA Newsletter. A neat trick, if I ever saw one, he gets the glory, and we do the work.

As your new editor I am herewith informing you, that the SIGDA Newsletter, which has heretofore been a good publication, will be maintained at its high standards. However, a few remarks are in order.

Only 83 people, out of a total of more than 200, took part in the election. This low participation may well have been caused by the fact that the candidates were not known to the membership. This anonymity, in turn, is at least partly due to lack of activity on the part of SIGDA, and lack of communication among its members. This newsletter will endeavor to remove the second of these lacks. The methods it will employ to achieve this goal are currently planned to be as listed below. Changes will be made to these methods whenever new ideas are brought forward and convincingly presented. Readers are invited to participate in this game. The newsletter is your servant, not your master, so don't hesitate to tell it what to do.

The SIGDA Newsletter will attempt to accomplish the following tasks:

1. Provide a chronicle of SIGDA and other DA-related activities during the period immediately preceding its publication.
2. Serve as a medium for the dissemination of Chairman's messages, Executive Committee decisions, election results, announcements of upcoming meetings, appointments and other items concerning SIGDA business.

3. Serve as a medium for the dissemination of news concerning SIGDA members, report their achievements, publications, patents and personal data.
4. Serve as a medium for the dissemination of technical information and newsworthy items related to DA.
5. Serve as a forum for the expression of opinions related to items previously published.
6. Exercise a unifying influence on the activities of SIGDA. This editorial policy can be put into a nutshell by stating that DA is a multidisciplinary activity, and that SIGDA is trying to crystallize the common ingredients from the various approaches reported by its members.

Walter J. Samek

Technical papers appearing in this issue are unrefereed working papers.

Attention all Authors

Authors of DA related papers, talks, articles or books are herewith invited to submit a one-paragraph abstract of their work for publication in the SIGDA Newsletter. Please note that all company rules on proprietary material, all government regulations on classified information, and all publishers' rules on abstracts must be observed by the authors. SIGDA accepts no responsibility for any unauthorized disclosure or other violation of such nature.

Attention all SIGDA members

The SIGDA Newsletter depends on you for information concerning newsworthy items for its pages. So keep those cards and letters coming to any one of the editors, whose names, addresses and phone numbers are listed below.

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Design and Automation

Designautomation

Design Automation System

By C. E. Radke

At the recent ACM 70 Conference, Bob Hitchcock chaired the SIGDA meeting. There were four of us in attendance: Bob (IBM), John Hanne (Texas Instruments), Murray Freeman (Philco), and myself (IBM). Later we caught a passer-by, Bob Brover (UCLA student). Although Bob was not acquainted with SIGDA or its purposes, at our insistence he did come up with a definition of Design Automation (DA). His on-the-spot definition was:

DESIGN - An iterative, decision-making process that seeks to optimize the value of society's resources.

AUTOMATION - Selecting of procedures for doing work with less effort.

To me this definition sounds very much oriented toward the DA user (i.e., the engineer who is looking for a "tool" to aid him in his developing his design).

What happens if one asks a DA Development group (i.e., those individuals who generate the computer programmed procedures) that same question? One might expect a definition for the entire phrase: "Design Automation, why it's really not automation, its computer-aided design." The key word, of course, refers to the person's main interest - "computer". Let's now ask the Information Systems man what DA is. He might say: "First, it isn't Design Automation, it is DA System; and a DA System is the software required to enter all design information into a computer document it, keep records, and turn out manufacturing data. A course, today all this must be terminal oriented.

Which function do you serve; what is your definition? Whichever it is, SIGDA will want to serve you.

We went through another exercise at the SIGDA meeting at the ACM 70 Conference in New York City. We formed a two-dimensional array with "Discipline" on the Y-axis and "DA Function" on the X-axis. For example, for discipline one might have:

Aerospace Design

Civil Engineering

Mechanical Engineering

Automotive Engineering

Electronics Circuitry Design

Computer Design

Optical System Design

Communication System Design

And for function one might list:

Simulation and Modeling

Testing

Fault Diagnostics

Design Verification

Packaging and Physical Realization

Synthesis

Input of Design Data

File Structure Definition and File Updating

Documentation

Process Automation

Records

Languages

Manual Input/Override

At a particular X-Y coordinate intersection one might find either a blank, or a full history of the effort expended to fulfill the particular function by DA for the selected discipline. For example, one might expect a small amount of effort to generate test procedures to test an automobile design, but would find that much more effort was required to aid in fault detection of a computer system and its parts. As you can visualize, the number of combinations of discipline, function, and degree of effort is large, and that is another reason for you to let us know where you fit in the matrix.

The following item is included in this issue to illustrate one DA application to mechanical design.

Design Automation of Expansion Joints

An expansion joint is a part of a gas duct placed between various boiler components to absorb thermal expansion without transmitting forces. Its shape is similar to that of an accordion.

The computer used is an IBM 7070, conversion of the program to the IBM 360 is imminent. Input consists of length and width of the rectangular opening to be covered (typically 10 x 20 feet), and the number of pleats desired (this may be anywhere between 1 and 9).

The program selects the proper plate design from 14 standard shapes, adjusts certain dimensions to make the plates fit the desired size of opening, and produces:

- a. a parts list showing the different plates used and how many of each,
- b. a pictorial representation of every plate by means of a printed plot,
- c. a perforated paper tape for every plate.

These paper tapes are used on a Wiedematic punchpress to produce the necessary plates from 10 gage steel, which are afterwards folded to generate the pleats, and welded together. No conventional method can produce better fitting expansion joints.

