ADVANCES IN CIRCUITS AND SYSTEMS

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1985 ICCAS
PROGRAM SCHEDULE

	Morning	Inaugural Session, Room: "GREAT WALL"				
Monday, June 10	Afternoon	S–1 VLSI Design-Testing and Applications	S–5 Graph Theory and Applications I	S–9 Digital Filters and Processing I	S–13 Active Networks	S–17 Nonlinear Systems I
Tuesday, June 11	Morning	S–2 VLSI Layout	S–6 Graph Theory and Applications II	S–10 Digtal Filters and Processing II	S–14 Network, Terminations and Power Transfer	S–18 Nonlinear Systems II
	Afternoon	S–3 VLSI Layout and Design	S–7 Fault Analysis I	S–11 Signal Processing and Distributed Networks	S–15 Circuit Simulation and Analysis I	S–19 Circuit Analysis and Application I
Wednesday, June 12	Morning	S–4 Noise Reduction and Switched Capacitor Filters	S–8 Fault Analysis II	S–12 Communication Circuits and Systems	S–16 Circuit Simulation and Analysis II	S–20 Circuit Analysis and Application II
Room		"BEIJING"	"SHANGHAI"	"GUANGZHOU"	"HANGZHOU"	"XIAN"

TECHNICAL SESSIONS

* Manuscript not available for publication.

Session 3:

VLSI Layout and Design

Chairman: J. K. Wu, Institute of Computing Technology, Academia Sinica, China; O. Wing, Columbia University, U. S. A.

Session 4:

Noise Reduction and Switched Capacitor Filters

Chairman: D. R. Gu, Chendu Institute of Radio Engineering, China; K. R. Laker, University of Pennsylvania, U. S. A.

Session 16:

Circuit Simulation and Analysis II

Chairman: X. Zhang, Shanghai Jiaotong University, China.

Session 17:

Nonlinear Systems I

Chairman: L. O. Chua, University of California, Berkeley, U. S. A.

Session 18:

Nonlinear Systems II

Chairman: I. W. Sandberg, AT&T-Bell Laboratories, U. S. A.

CIRCUIT THEORY EDUCATION: PAST and FUTURE

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SUMMARY

A new field relating to technology emerges from some industrial need or dramatic innovation or breakthrough. People then identify with that field by chance assignment; luck and being at the right place at the right time are factors. Papers are then written, reports made, sometimes books appear. Then courses will begin to appear at some universities. If the interest persists and spreads, then some professional organization will be formed and journals established. If the courses are offered at many universities, eventually a standard or canonical list of topics will emerge. Once a stable flow of students has been established, then education in that field is said to exist.

The Origins of Circuit Theory

Circuit theory as a field emerged from the technical needs of the telephone industry. Early contributors to circuit theory were simply assigned to work in this field when they were employed by the telephone industry. They entered with a diversity of backgrounds: mathematics, physics, various branches of engineering. Then through self study and associating with peers they became experts in circuit theory. In this manner our field was established by intellectual giants such as Bode, Campbell, Cauer, Darlington, Foster, Norton, Nukiyama, Nyquist, Takahashi, Zobel and many others.

Circuit Theory Education

Circuit theory education in the U.S.A. was established by Ernst Guillemin at MIT. For the decade of the 1930's, his class was a small operation, a few graduate students at MIT many of whom went to work for Bell Telephone Laboratories after graduation. This ended during World War II and Guillemin spent his time working on technical problems associated with radar and related fields. An explosion of interest occurred at the close of that war and enrollment in Guillemin's course in network synthesis soared to 150 or more students each term. Thus was established the Guillemin Dynasty.

The multitudes so educated and infused with Guillemin's enthusiasm followed two paths:

(1) Many went to other universities to establish dynasties of their own and turned out graduates of their own for industry and yet other universities. Almost everyone in circuit theory in the USA can trace their genealogy back to Guillemin.

(2) Others joined in a diffusion into related fields: control, communications, computers. Guillemin thus had an unprecedented influence on technological development in general.

The Guillemin Dynasty at MIT continued for at least two decades. And then a very strange thing happened. When Guillemin retired, he was not replaced and his Dynasty at MIT ended. MIT was to pay a price for this decision much later when VLSI emerged as an important topic and MIT was late in entering this important new field. It was to continue at many other prominent departments of electrical engineering. Interest has never been as high as it was during our Golden Era when courses in analysis and synthesis were part of most graduate programs. It subsided only when other new and exciting fields began to compete for the attention of students.

Circuit Theory in the High-Tech Era

There is every indication that the explosion of knowledge that created circuit theory education right after World War II is about to happen again in the establishment of a new field related to high technology. The technological advances that have given rise to this explosion relate to the emergence of microelectronic circuits of ever decreasing cost and size and the consequent development of LSI and VLSI. In turn, VLSI has made possible the development of supercomputers and artificial intelligence.

Research in the areas described is taking place throughout industry and at a dozen universities. Courses are in various stages of development as a result: seminars, experimental courses, formal courses. Some books have been published; many are in progress. The new field may emerge as a group of subfields or perhaps even as a single field. It is not yet obvious what the title of the new fields will be.