FOREWORD

Our special issue contains the lectures given at the *Seminar on Measurement Theory*, 10—17 April 1983, Budapest. The seminar has been initiated by the *Department of Measurement and Process Control, University of Karlsruhe*, and by the *Department of Measurement and Instrument Engineering, Technical University of Budapest*. A limited number of participants from other institutions has been invited, too. The purpose of the seminar was to give the participants a survey of selected fields of measurement theory, to discuss different practical applications and to give the possibility, especially to young people, to gain some experience in such tasks.

The seminar turned out to be a real success. The limited number of participants allowed informal proceedings with contributions and personal discussions; social programs gave the chance to discuss different topics.

The reader will find among the papers some tutorials and others on practical applications.

Two main topics dominate the material. The first one is *estimation theory*, the other one is *finite word length effects*.

Professor H. Kronmüller's paper presents an introduction to estimation theory, the papers of *Mr. Stöckle*, *Mr. Pross* and *Mr. Fortgens* deal with special applications of it. *Mr. Stöckle* analyses the problem of predicting the steady-state value of transient output signals of systems (weighing, temperature measurement) in the case when certain parameters (as time constants) of the system are known, and so the so-called exogenous process model can be used. *Mr. Pross* deals with the more general case when the simultaneous estimation of different process parameters is needed. For the resulting nonlinear estimators some useful expressions are derived. *Mr. Fortgens* summarizes methods of time delay estimations with applications to brain examinations.

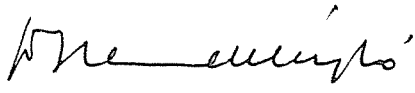
Finite word length effects are dealt with in four further papers. *Mr. Dobrowiecki* gives a survey of possibilities of modelling quantization. *Mr. Kollár* reviews the useful results of the statistical theory of quantization.

Mr. Horváth examines roundoff problems of the fast Fourier transform algorithm, and uses these results for the design of FFT hardware. *Mr. Péceli* deals with finite word length effects in digital filters.

Last but not least let us briefly review two more specific papers. *Mr. Dane* has examined the possibilities of modelling the thermoregulation of newborn babies. Inspite of the difficulty of the problem — all biological systems are different, time-varying, you must be very careful when making measurements on these very sensitive small creatures etc. — he achieved results which may be useful for later incubator designers. *Mr. Medved et al.* presented a measuring system for high-frequency admittance measurements of liquids.

We are very glad that we could organize this successful meeting and are looking forward to the next one.

Budapest, September 1983.



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