Theory and Applications of Spline Functions

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SERIE A MATHEMATIK

This collection is dedicated to the memory of I.J. Schoenberg, the founder of spline functions theory

Motto:

"Spline approximation contains the delicious paradox of Prokofieff's Classical Symphony: it seems as though it might have been written several centuries ago, but of course it could not have been"

Philip J. Davis

(Symposium on Approximation of Functions, Warren, Michigan, USA, 1964)

Preface

Today it seems to be a difficult adventure to propose a list of literature on spline functions and their applications. Consider the fact that in Europe, America, Russia, China, Japan and elsewhere there have appeared more than 358 books, monographs and conference reports, more than ten thousand original publications and more than 302 dissertations for doctor's degree or habilitation on various aspects of spline functions and their applications.

The present list, now in fifth revised edition, shows that the actual development of spline theory has an essential influence on large areas of modern numerical mathematics,

- interpolation and approximation,
- numerical integration and differentiation,
- numerical treatment of ordinary and partial differential equations,
- numerical treatment of integral equations,
- optimal approximation,
- calculation of eigenvalues and eigenfunctions of operators,
- control theory,
- numerical methods of probability theory and statistics.

All publications that have become known to us until beginning of August 1996 are listed, subdivided into three sections:

1. books, monographs and conference reports,
2. original publications,
3. dissertations for doctor's degree or habilitation.

Papers published in conference reports are not mentioned separately again. Preprints being not generally accessible are not quoted. In order to make this list as complete as possible all sources available have been exploited over many years: Mathematical Reviews, Zentralblatt für Mathematik, Referativnii Zhurnal, Bulletin Signalétique, Computing Reviews, Computer Abstracts, Dissertation Abstracts, Current Mathematical Publications, books and journals from many mathematical libraries in various universities.

We thank cordially all colleagues who have helped us with informations, hits and advices. The first named author expresses his thanks to Alexander von Humboldt Foundation and also to DAAD (Deutscher Akademischer Austauschdienst) for granting him several research stays in the Federal Republic of Germany. Thus he has had many opportunities for stimulating exchange of ideas with German colleagues and also excellent mathematical sources of information.

To conclude, we express our hope that this list of literature on spline functions and their applications will be helpful to many mathematicians, scientists and engineers working in this field or using relevant methods and results.

Moreover, we wont to dedicate this work to the memory of Professor I.J. Schoenberg, the founder of the theory of spline functions.

Cluj-Napoca and Berlin, August 1996

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