Preface

This book is the continuation of [T10]. A corresponding more detailed description is given in the Introduction, Section 1.1, and in Section 1.4. Otherwise we tried to make this text independently readable. For this purpose we provide in Chapter 1 notation, definitions, basic assertions and related references. The short Chapter 2 deals with discrepancy for Besov spaces on intervals. However it is the main aim of this book to extend our assertions about sampling and numerical integration from unweighted spaces on intervals and domains in $\mathbb{R}^n$ (preferably cubes) to corresponding weighted spaces. Chapter 3 deals with weighted spaces on the real line. Corresponding considerations in higher dimensions are based on weighted spaces of Besov–Sobolev type with dominating mixed smoothness. This will be done in Chapter 4. We always rely on Haar bases, Faber bases and Faber systems of higher smoothness.

Formulas are numbered within chapters. Furthermore in each chapter all definitions, theorems, propositions, corollaries and remarks are jointly and consecutively numbered. Chapter n is divided in sections $n.k$ and subsections $n.k.l$. But when quoted we refer simply to Section $n.k$ or Section $n.k.l$ instead of Section $n.k$ or Subsection $n.k.l$. If there is no danger of confusion (which is mostly the case) we write B^s_{pq}, $S^r_{pq}B$, …, b^s_{pq}, $s^r_{pq}b$, … (spaces) instead of $B^s_{p,q}$, $S^r_{p,q}B$, …, $b^s_{p,q}$, $s^r_{p,q}b$, …. Similarly a_{jm}, λ_{jm}, Q_{km} (functions, numbers, rectangles) instead of $a_{j,m}$, $\lambda_{j,m}$, $Q_{k,m}$ etc. References ordered by names, not by labels, which roughly coincides, may occasionally cause minor deviations. The numbers behind the items in the Bibliography mark the page(s) where the corresponding entry is quoted (with the exception of [T10]); log is always taken to base 2. All unimportant positive constants will be denoted by c (with additional marks if there are several c's in the same formula). To avoid any misunderstanding we fix our use of $\sim$ (equivalence) as follows. Let I be an arbitrary index set. Then

$$a_i \sim b_i \quad \text{for } i \in I \text{ (equivalence)}$$

for two sets of positive numbers $\{a_i : i \in I\}$ and $\{b_i : i \in I\}$ means that there are two positive numbers c_1 and c_2 such that

$$c_1 a_i \le b_i \le c_2 a_i \quad \text{for all } i \in I.$$

It is my pleasure to thank Erich Novak for many stimulating discussions and Dorothee D. Haroke for her remarks and for producing all the figures.

Jena, Winter 2011 Hans Triebel