

# Preface

This book is a collection of papers written or co-authored by participants in the “Twenty Years of Wavelets” conference held at DePaul in May, 2009. The conference attracted almost a hundred participants from five different countries over three days. There were 13 plenary lectures and 16 contributed talks. The conference was envisioned to celebrate the twentieth anniversary of a one-day conference on applied and computational harmonic analysis held at DePaul in May 1989 and was organized by one of the editors, Jonathan Cohen. The 1989 DePaul conference was scheduled to supplement a two-day special session of a regional AMS meeting on computational harmonic analysis and approximation theory. Combined together, the three days of talks may have been the first conference in the United States which featured the subject of wavelets. Although the focus of that conference was computational harmonic analysis, wavelet theory, which was in its infancy at the time, played a central role in the three days of talks.

After two decades of extensive research activities, it was appropriate to pause and have a look back at what had been accomplished and ponder what lay ahead. This was exactly the aim of the 2009 conference. The conference had two sub-themes, past and future. Some of the plenary speakers, including I. Daubechies and J. Kovačević, gave expository and survey talks covering the history and major accomplishments in the field and some speakers focused on new directions for wavelets, especially in the area of geometric harmonic analysis.

All conference speakers were invited to submit papers related to the themes of the conference. This was interpreted broadly to include articles in applied and computational harmonic analysis. Though many of the articles are based on conference presentations, this book was not envisioned as a proceedings and some of the articles represent material not presented at the conference. All the papers in this book were anonymously refereed.

The book is divided into three parts. The first is devoted to the mathematical theory of wavelets and features several papers on the geometry of sets and the development of wavelet bases. The second part deals with the underlying geometry of large data sets and how tools of harmonic analysis prove useful in extracting information from them. The third part is devoted to exploring some ways that harmonic analysis, and wavelet theory in particular, have been applied to study real-world problems.

The articles in this book are mostly written by mathematicians and are intended for mathematicians and engineers with some background in Fourier analysis and the theory of wavelets. The book should be accessible to workers in the field and to graduate students with an interest in working in related areas.

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Finally, we note with sadness that one of the authors in this volume, Daryl Geller, passed away in late January. He was a very fine mathematician who will be missed by his colleagues and friends.

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