

Preface

This special issue is dedicated to applications of graph spectra in computer science. The spectra of matrices associated with a graph, such as the adjacency and the Laplacian or normalized Laplacian matrix, are widely used to characterize various properties of a graph. Apart from a natural link to discrete mathematics, the theory of graph spectra has many applications in other scientific fields, such as chemistry, statistical physics, and quantum mechanics. In computer science, spectra of graphs provide fundamental techniques for solving such important algorithmic problems as graph partitioning, the design of interconnection networks, information retrieval, and data mining.

This issue gathers a collection of papers, most of which were presented at the “Conference on Applications of Graph Spectra in Computer Science,” held at the Centre de Recerca Matemàtica, Bellaterra, Barcelona, July 16-20, 2012. Around 50 mathematicians from 14 countries participated in the conference. The conference benefited greatly from invited talks by Daniel Spielman (Yale), Ulrike von Luxburg (Hamburg), Fan Chung (San Diego), Piet Van Mieghem (Delft), Dragoš Cvetković (Belgrade), Jürgen Jost (Leipzig; lecture was presented by Frank Bauer), Nathan Linial (Jerusalem), Edwin Hancock (York), Ernesto Estrada (Strathclyde), Miquel Àngel Fiol (Barcelona), and Anirban Banerjee (Kolkata).

All papers in this special issue went through a full review process. We would like to express our appreciation to the reviewers for their insightful reports. We also thank all the authors who submitted their work to this issue.

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Group photo from the “Conference on Applications of Graph Spectra in Computer Science”, Centre de Recerca Matemàtica, Bellaterra, Barcelona, July 16-20, 2012.

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