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# Proceedings of the 5<sup>th</sup> International Conference on Applied Operational Research





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# **Preface**

Operational Research is an important scientific discipline with many new theoretical developments and practical applications. The International Conference on Applied Operational Research (ICAOR) is an annual forum bringing together academics and practitioners from around the world to discuss the most recent developments in operational research and management science (OR/MS). The conference covers all aspects of our subject, but with a particular emphasis on applications. This year, the fifth event in our planned series of conferences – ICAOR 2013 – takes place in the city of Lisbon, Portugal.

We received quality submissions from approximately 20 countries around the world and finally could accept 23 papers for presentation at the conference and publication in these proceedings.

The papers that appear in this volume were carefully and thoroughly refereed. Our sincere thanks go to the members of the scientific programme committee who gave a significant amount of their valuable time to this task. We are also very grateful to all those who have helped in organising the conference. We are sure that their contributions will add significantly to the success of the conference.

We very much hope that you will enjoy the conference programme and the planned social events. We wish you all a very pleasant stay in Lisbon and trust that you will find the conference to be of value and leave us having made many new friends.

Julian Scott Yeomans ICAOR'13 Chairman

Kaveh Sheibani ICAOR General Chair

July 2013

# 5<sup>th</sup> International Conference on **Applied Operational Research (ICAOR'13)**

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