ABSTRACT BOOK

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1. FOREWORD

On behalf of the Organizing Committee, we are very pleased to welcome you to the 3\textsuperscript{rd} International Conference of Mathematical Sciences (ICMS 2019) to be held between 4-8 September 2019 at Maltepe University in Istanbul.

We hope that, ICMS 2019 will be one of the most beneficial scientific events, bringing together mathematicians from all over the world, and demonstrating the vital role that mathematics play in any field of science.

Welcome to our conference, Maltepe University, İstanbul!

Hüseyin Çakalh
Chairman of the Organizing Committee
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Y. Lio (USA)
Yusuf Unlu (Turkey)
Yi Mu (Australia)
Zbigniew Piotrowski (USA)
3. SESSIONS

The lectures in the following parallel sessions are to be held after the plenary speakers lectures:

1. "Topology" organized by Ljubisa D. R. Kocinac,
2. "Analysis and Functional Analysis" organized by Ibrahim Canak,
3. "Sequences, Series, Summability" organized by Hacer Sengul,
4. "Fixed Point Theory" organized by Duran Turkoglu,
5. "Numerical Functional Analysis" organized by Allaberen Ashyralyev,
6. "Computer Science and Technology" organized by Sahin Uyaver,
8. "Recent themes on Controllability and Stability of PDE’s" organized by Valria Neves Domingos Cavalcanti, and Marcelo Moreira Cavalcanti,
10. "Geometry, and Mathematical Education" organized by İlhan Gül.
4. ACKNOWLEDGMENTS

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There are many people who spent a lot of time and effort to make this conference possible. We would like to thank especially to the following young colleagues who had contributed to the success of this conference in various ways:

Önder Şahinaslan, Maltepe University, Turkey
Fuat Usta, Düzce University, Istanbul, Turkey
Özkan Değer, Istanbul University, Istanbul, Turkey
Complexity Analysis of Primal-Dual Interior Point Methods for Semidefinite Programming Based on a New Kernel Function with an Hyperbolic Barrier Term

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In this paper, we present a new primal-dual interior point algorithm for SDP problems based on a new kernel function. By simple analysis, we derive the iteration bounds $O\left(\frac{n^{\frac{3}{2}} \ln \frac{n}{\epsilon}}{\gamma}\right)$ for large-update methods and $O\left(\sqrt{n} \ln \frac{n}{\epsilon}\right)$ for small-update methods. These results match the currently best known iteration bounds for large- and small-update methods based on the hyperbolic kernel functions.

**Theorem 1.** Let $\Psi_0$ be an upper bound for $\Psi(\beta V)$ during the process of the algorithm and let $\tau \geq 1$. Then, the total number of iterations to obtain an approximation solution with $n\mu \leq \epsilon$ is bounded by

$$\left[96 \frac{\Psi_0^{\frac{3}{2}}}{\gamma} \frac{1}{\ln \frac{n}{\epsilon}}\right].$$

**Keywords:** Semidefinite programming, primal-dual IPMs, complexity analysis.

**2010 Mathematics Subject Classification:** 90C22, 90C51, 90C31.

**References**
