ABSTRACT BOOK

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7^{th} INTERNATIONAL CONFERENCE OF MATHEMATICAL SCIENCES ICMS 2023

5-9 JULY 2023

İSTANBUL, TÜRKİYE

Supported by

Edited by

Özkan Değer and Hüseyin Çakallı

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1. FOREWORD

On behalf of the Organizing Committee, we are very pleased to welcome you to the 7th International Conference of Mathematical Sciences (ICMS 2023) to be held between 5-9 JULY 2023 via face-to-face and online Conference supported by Maltepe University in Istanbul. We hope that, ICMS 2023 will be one of the most beneficial scientific events, bringing together mathematicians from all over the world, and demonstrating the vital role that mathematics plays in any field of science. Welcome to our conference at Maltepe University.

Hüseyin Çakallı
Chairman of the Organizing Committee

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Pratulananda Das (India)

3. SESSIONS

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

0. **"Plenary"** organized by Hüseyin Çakallı,
1. **"Topology"** organized by Ljubisa D.R. Kocinac and Osman Mucuk,
2. **"Analysis and Functional Analysis"** organized by Hacer Şengül Kandemir and Nazlım Deniz Aral,
3. **"Sequences, Series, Summability"** organized by İbrahim Çanak and Sefa Anıl Sezer,
4. **"Fixed Point Theory"** organized by Duran Türkoğlu and Hakan Şahin,
5. **"Numerical Functional Analysis"** organized by Allaberen Ashyralyev and Charyyar Ashyralyyev,
6. **"Computer Science and Technology"** organized by Şahin Uyaver and Önder Şahinaslan,
7. **"Mathematical Methods in Physics"** organized by Özay Gürtuğ and Filiz Çağatay Uçgun,
8. **"Applied Statistics"** organized by Müjgan Tez and Kadri Ulaş Akay,
9. **"Differential Geometry"** organized by Zerrin Şentürk,
10. **"Algebra"** organized by Leyla Bugay,
11. **"Fundamentals of Mathematics and Mathematical Logic"** organized by Tahsin Öner and İbrahim Şentürk.

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Serdar ANGÜN, Maltepe University, Istanbul, Türkiye,
Fikriye İnce Dağcı, Kültür University, Istanbul, Türkiye

Hüseyin Çakallı
Chairman of the Organizing Committee

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A Modern Approach to Data Privacy with Federated Learning

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Abstract

Today, information technologies and their usage areas are increasing day by day. Advanced technologies such as the internet of things, smart devices and applications, machine learning and artificial intelligence are a driving force in the spread of their usage areas. The increase in prevalence and use also increases the production and sharing of data. This increase causes various security problems and concerns in terms of data privacy. Therefore, a balance has to be struck between the need for data sharing and its security. For this purpose, the use of federated learning methods has been examined. Traditional data sharing methods focus on centralized solutions for the processing of private and sensitive data of data subjects, but this causes various problems and raises concerns in the sharing of sensitive data. In the federated learning model, it trains locally without data sharing. It has a distributed artificial intelligence approach that can run different resources together. Thus, it offers an alternative solution that can help address data privacy concerns arising from the traditional method. In this study, the basic principles, usage areas, advantages and difficulties of federated learning, which is also accepted as a modern approach in data privacy, are discussed. The data and examples obtained in the study will be presented.

Keywords: Information Security, Artificial Intelligence, Federated Learning, Data Privacy, Technology and Innovation
2020 Mathematics Subject Classification Numbers: 68P27, 68M25, 68T05

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