



ICAAA 2012

INTERNATIONAL CONFERENCE ON APPLIED ANALYSIS AND ALGEBRA

Editors

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FOREWORDS

The "International Conference On Applied Analysis And Algebra (ICAAA2012)" jointly organized by Yıldız Technical University, Putra University of Malaysia, and Malaysian Mathematical Sciences Society will be held on 20-24 June 2012 in Istanbul, Turkey.

The aim of this conference is to bring the math community working in the new trends of applications of math together in a wonderful city of the world, Istanbul. This conference is dedicated to Prof. Ravi P. Agarwal on his 65th birth anniversary.

The organization scheme of this conference was formed by Organizing, Scientific and Local Committees. The Scientific and Organizing Committees are formed by form different Universities worldwide. Ten worldwide distinguished plenary speakers are invited.

There have been quite a number of applications from different regions. It was a very difficult task to select abstracts among all these applications. Although, there were many good submissions that we had to reject, we tried to do our best to accommodate many speakers in order to have a better and reach scientific meeting which will provide interactions, exchanges among the participants.

Besides the scientific program, in such short time, we also tried to offer some social activities (such as boat trip for sight seeing, city tour, etc.) where we believe that these occasions will provide informal discussions which will serve the purpose of our meeting.

We also observed that many talks will be delivered by young researchers. This fact was very welcome by the committees.

The talks that are going to be delivered cover a wide range of mathematics which was also one of the goals of this organization. Among the topics that are going to be presented are mostly applied oriented talks on analysis, algebra, statistics, computer mathematics, discrete mathematics, geometry, etc. We believe that this richness will provide the basis for interdisciplinary collaborations.

We also would very much thank to all presenters and participants for their interest in our conference and believe and hope that each of them will get the maximum benefit from this meeting.

Finally, we also would to thank to Prof.Dr.İsmail Yüksek who is Rector of Yıldız Technical University (Host University), Putra University of Malaysia, and Malaysian Mathematical Sciences Society for their support. We thank to the

plenary speakers that accepted our invitation and spend their precious time by sharing their ideas in our conference. We also thank to all members of organizing committee. We also thank to the academic staff of both Mathematics and Mathematics Engineering Departments of Yıldız Technical University.

We are sure that there are many people and may be some other organizations that may have been forgotten to be mentioned explicitly here, hoping their understanding, we thank all that have put their effort to make this occasion possible.

We welcome each and every one of you to this conference; we wish a very enjoyable and productive conference and hope to meet again in different occasions.

Sincerely yours,

**Prof. Dr. Mustafa Bayram, Chair
On behalf of the Organizing Committee**

MESSAGE FROM CO-CHAIR

"In the name of Allah, the Most Compassionate and the Most Merciful"

Thus first of all we are very grateful to Allah (s.w.t) that provided the life to meet all of us during this memorable occasion and all praise to be upon Muhammad (s.a.w) who is guidance for the entire universe.

It is a great honor for me to be a part of this International Conference on Applied Analysis and Algebra (ICAAA 2012) and welcome all the speakers as well as participants. I sincerely thank Prof. Ismail Yuksek, the Rector of Yildiz Technical University being a host for this annual conference and also welcome and acknowledge all participants of our conference. Further I just like to state that this conference is the joint activity among Yildiz Technical University, University Putra Malaysia and Malaysian Mathematical Sciences Society. Therefore I personally thank all our organizers for their dedication and sincere contribution to make this conference as a success.

I also thank all the member of the organizing committee in particular chairman of the conference **Prof. Mustafa Bayram** and his team for their hard work and commitment as well as their efficiency. I believe that this year is much better than the last year and I am sure future will be better than today.

As we all know that the aim of this conference is to bring all of us together as mathematicians working in the recent developments and new trends if possible in their applications in a wonderful city of the world, **Istanbul**. The organizing committee is also delighted to **dedicate this memorable event to Prof. Ravi P. Agarwal on his 65th birth anniversary**. We just like to say that the words are not enough to express how much we appreciate his presence during this conference and wishing Prof. Agarwal very happy birthday and many more.

I also make a friendly suggestion to the all participant that the outcome of this conference will be published in various prestigious journals. Please take note and advantage as well to fit your work in excellent quality with one of the related journal. Do not miss the opportunity.

Once again I make pray by saying O Allah! Grant blessings and peace to our master Muhammad (s.a.w) to the number of the particles of the universe, and to all his Family and Companions. And all praise be to Allah, the Sustainer of All the Worlds. May Allah grant all of us happiness in this world and in the hereafter (Amen).

**Thank you all,
Prof. Dr. Adem Kilicman, Co-Chair
University Putra Malaysia**

**Foreword by PRESIDENT
Malaysian Mathematical Sciences Society
(PERSAMA)**

It is my privilege to welcome you at the International Conference on Applied Analysis and Algebra (ICAAA 2012) and thank to Yildiz Technical University for all the hard work in preparation for it.

PERSAMA is honoured to be one of the co-organisers of this conference in conjunction with dedication to Prof Ravi P. Agarwal on his 65th birth anniversary. We hope for more interactions, among us as well as among leading mathematical scientists of the international community. This conference will provide the opportunity for mathematicians to share their latest ideas of applied analysis and algebra. In addition, we hope for possibility of applying the research outputs into other disciplinary areas.

I wish that all our delegates and participants will depart from this international conference with the satisfaction of having a very fulfilling pleasant and rewarding experience.

Last but not least, once again I would like to express my gratitude to Yildiz Technical University for giving PERSAMA an opportunity to be part of this prestigious conference.

Prof. Dr. Mohd Salmi Md. Noorani
President,
Malaysian Mathematical Sciences Society

Foreword by Director of the INSPEM

First and foremost I would like to thank the organizers of the ICAAA 2012 conference for inviting me to pen a few words of welcome in this souvenir pamphlet.

On behalf of the Institute for Mathematical Research (INSPEM) Universiti Putra Malaysia (UPM) I would like to welcome all speakers and participants to the conference. I would like also to take this opportunity to congratulate the organizers for having successfully planned and implemented all the programs in this conference. Planning of such a conference where the number of participants is big does indeed require meticulous attention and planning. In my view the organizing committee has done an excellent job in this respect. I am sure an equal focused attention will be given to ensure an efficient running of the conference.

On behalf of the mathematics community of UPM I would like also to take this opportunity to extend our heartiest congratulations to Prof Ravi Agarwal to whom this conference is dedicated to on the occasion of his 65th birthday. May he prosper, enjoy the best of health and continue to contribute to the advancement of mathematics

This conference is the second in the series of conferences organized by Yildiz University and Universiti Putra Malaysia. The first one was held in 2011 in the same venue. This second conference is indeed significant as it is held under the ambit of an MOU signed by the two universities early in the year. This will mark an important milestone in the implementation of programs under the MOU. We will continue to identify more common activities that can be carried to ensure that the networking that has been established will further bloom and flourish.

To all participants may this conference be an exciting one in which we shall share our ideas and findings with fellow participants. This is also an opportunity to renew old acquaintances and start new ones. I wish everyone fruitful deliberations in this conference and may we meet again in the not too distant future.

Prof Dato' Dr. Kamel Ariffin Mohd Atan
Director, Institute for Mathematical Research (INSPEM),
Universiti Putra Malaysia.

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Wiener Chaos Expansion under G-Brownian Motion

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Abstract: The notion of G-expectation, a type of nonlinear expectation proposed by Peng has received very strong attention in recent years, under which the canonical process is a G-Brownian motion and the related stochastic calculus especially G-Itô's integrals have been established. In this paper we prove the equivalent theorem of Wiener chaos with respect to G-Brownian motion in the framework of sublinear expectation space. Moreover we establish some relationship between Hermite polynomials and G-stochastic multiple integrals. An equivalent of the orthogonality of Wiener chaos was found.

Keywords: G-Expectation, G-Brownian Motion, Hermite Polynomials, G-Stochastic Multiple Integrals, Wiener Chaos.

Clique Identification in Flight Route Problem

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Abstract: *Clique* is a subset of a directed graph which has at least three vertices. For each pair of vertices P_i and P_j in these subsets, both $P_i \rightarrow P_j$ and $P_j \rightarrow P_i$ is true. The subsets are made largest possible; in the sense that it is impossible to

add other vertices into these subsets. By identifying *clique* we can know the relationship among the airports so that known which cities can be traversed to go from one city to another. It also can know which airports are busy or large airport of on every island in Indonesia. *Clique* identification is done on the flight route Sriwijaya Air and Garuda Indonesia. Each clique consists of only three cities, and includes Jakarta. The cities that form the *clique* are Banda Aceh, Medan, Batam, Pekanbaru, Palembang, Semarang, Surabaya, Banjarmasin, Balikpapan, Ujung Pandang, Gorontalo, Manado, Ambon, Kendari, Palu, Temate, Denpasar, Kupang, Timika, Biak, and Jayapura. The number of airports that make up *clique* on Sriwijaya Air flight is less than the Garuda Indonesia flight. The number of *clique* that can be formed on Sriwijaya Air flight more than on Garuda Indonesia flight.

Keywords: Clique, Flight Route, Relationship Among Airports in Indonesia.

Fixed Point Techniques and Stability for Neutral Nonlinear Differential Equations with Unbounded Delays

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Abstract: We use the contraction mapping theorem to obtain stability results of the scalar nonlinear neutral differential equation with functional delay;

$$x'(t) = -ax(t) + b(t)x^2(t-r(t)) + c(t)x(t-r(t))x'(t-r(t)).$$

Keywords: Contraction Mapping, Stability, Nonlinear Neutral Differential Equation, Integral Equation.

Path Partition in Directed Graph Modeling and Optimization

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Abstract: Many real problems can be modeled as path partition problems in a directed graph. In fact, the latter, especially in the case of directed acyclic graph