



## *Editors*

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# ***Mathematical Methods in Science and Mechanics***

*Proceedings of the 16<sup>th</sup> International Conference on  
Mathematical Methods, Computational Techniques and Intelligent Systems (MAMECTIS '14)*

*Proceedings of the 5<sup>th</sup> International Conference on  
Theoretical and Applied Mechanics (TAM '14)*

*Lisbon, Portugal, October 30 - November 1, 2014*

*Mathematical Methods in Science and Mechanics*



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## Plenary Lecture 1

### Human Action Recognition in Videos



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**Abstract:** Human action recognition in videos is a prominent field in multimedia research with numerous fundamental applications, including video surveillance, patient monitoring systems, law enforcement, video indexing and human computer interface. While various algorithms have been developed for human action recognition the topic still remains a great challenge. There are infinite variations that can result from the combination of the various factors including the subject's body shape, motion, intention, surrounding environment and the dynamic context. Typical scenarios include scenes with cluttered, moving backgrounds, non-stationary camera, scale variations, changes in light and view points, etc. In this talk, novel algorithms for human action recognition are presented. The new algorithms are based on different types of features, such as for example contour-based features or silhouette-based features. For the classification step, experiments are obtained using support vector machine (SVM), K-mean and structure similarity measurement. Public data sets are illustrated and recognition methodologies performance are evaluated and compared. The obtained results demonstrate a promising solution for improved accuracy and efficiency.

**Brief Biography of the Speaker:** Mariofanna Milanova is a Professor of Computer Science Department at the University of Arkansas at Little Rock since 2001. She received a M.Sc. in Expert Systems and Artificial Intelligence in 1991. She obtained a Ph.D. in Computer Science in 1995 from the Technical University, Sofia, Bulgaria. Dr. Milanova conducted post-doctoral research in visual perception at the University of Paderborn, Germany. Dr. Milanova has extensive academic experience at various academic and research organizations worldwide. Dr. Milanova serves as a book editor for two books and as associate editor for various international journals. Her main research interests are in the areas of artificial intelligence, computer vision and communications, machine learning, privacy and security based on biometric research. She has published and co-authored more than 80 publications, over 53 journal papers, 11 book chapters, numerous conference papers and has 2 patents.

## Plenary Lecture 2

### Topological Methods for Higher Order Nonlinear Impulsive Boundary Value Problems



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**Abstract:** The theory of impulsive problems is well adapted to study real phenomena where sudden changes occur at certain moments. Several examples arise naturally, not only on a micro scale but also on a global level, in physics, medicine, biotechnology, economics, control theory, population and/or gene dynamics,... This theory has become an increasingly important field in research and it has been combined with different methods, boundary conditions and several interpretations for the impulse conditions.

This presentation will include two types of boundary and impulsive conditions:

A fourth-order periodic impulsive problem with a fully differential equation, that is, where the nonlinearity can depend in every derivatives till the third order, and the impulsive effects, are given by general functions, not necessarily linear. The main argument to obtain the existence of solutions is based in an iterative technique, not necessarily monotone; A three point impulsive boundary value problem, which higher order contains an increasing homeomorphism, and where the impulsive functions are given via multivariate generalized functions, including impulses on the referred homeomorphism.

The method used apply lower and upper solutions technique together with fixed point theory. Therefore we have not only the existence of solutions but also the localization and qualitative data on their behavior. Moreover a Nagumo condition will play a key role in the arguments.

**Brief Biography of the Speaker:** Feliz Manuel Minhós is a Professor in the Department of Mathematics, School of Sciences and Technology, University of Évora, PORTUGAL, and researcher in the Research Center in Mathematics and Applications of the University of Évora. He obtained a PhD in Mathematics in the University of Évora, Portugal, in 2002, and the Habilitation degree, by the same university in 2010. Prof. Minhós has a vast experience in different areas of Nonlinear Analysis, such as variational and topological methods for Boundary Value Problems, topological degree, fixed point theory, lower and upper solutions method, Mountain Pass theory, etc. He has published 1 scientific book, 52 papers in international journals, 5 pedagogical books for undergraduate students, presented many communications in international meetings all around the world and won several awards granted by Foundation for Science and Technology, Calouste Gulbenkian Foundation, Portuguese-American Foundation, CRUP, and by private enterprises. In his work there are collaborations in several projects with colleagues of Spain, USA, Italy, Bulgaria, Bahamas, Israel,... He is member of the editorial board of several International Journals, Guest Editor of 3 Special Issues, Reviewer of Mathematical Reviews. He is adviser of 3 PhD thesis ongoing and two already concluded.

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