

## Preface of the “Symposium on approximation, scientific computation and applications ASCA-2012”

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# Preface of the “Symposium on Approximation, Scientific Computation and Applications ASCA-2012”

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This Mini Symposium is related to approximation theory, numerical analysis and scientific of computation, as well as to applications in computational and applied sciences. Scientific computations connect numerical and symbolic computations. The fast progress in recent years in symbolic computations and variable-precision arithmetic provide high quality procedures and software for new applications of the classical areas, but also for a development of quite new approaches. Research in these areas has an important role and influence to development of new computational techniques in engineering and other sciences, as well as a fast progress in new technologies.

Five papers are included, each of which contains the new results and points to the possible application.

The first paper of M.P. Stanić, A.S. Cvetković and T. Tomović consider quadrature rules with maximal trigonometric degree of exactness with respect to an even weight function defined on  $(\pi, \pi)$  and give error estimates of such quadratures in the case when the integrand is an analytic function in some domain of the complex plane.

In the second paper, the authors G.V. Milovanović, D.Đ. Tošć and M. Albijanić derive a weighted generalized Birkhoff–Young quadrature of interpolatory type for numerical integration of analytic functions and study special cases of such quadratures with respect to the generalized Gegenbauer weight function.

The third paper deals with the so-called Boubaker polynomials which have recently been extensively applied to solve some physical problems. The authors of this paper, G.V. Milovanović and D. Joksimović, prove several properties of these polynomials, their relationship with Chebyshev polynomials and give an application in finding approximate analytical solutions of Love’s integral equation. This Fredholm integral equation of the second kind is appeared in an electrostatic problem.

R. Cavoretto considers the problem of efficiently interpolating a large number of irregularly distributed data on a generic domain and presents some generalized algorithms. These algorithms are based on a partition of unity method and involve the use of radial basis functions or zonal basis functions as local interpolants.

Finally, G.V. Milovanović, T. Igić and N. Tončev give a construction of quadrature rules of Gaussian type with logarithmic and/or algebraic singularities. The obtained quadratures can be used in some applications in engineering (fracture mechanics, damage mechanics, etc.), as well as in other computational and applied sciences.

## Gradimir V. Milovanović



Gradimir V. Milovanović is a Serbian mathematician, who was born on 2nd January, 1948 (Zorunovac). He graduated (1976) and received PhD in Mathematics (1976) at the University of Niš. In the period 1976–2008 he was a professor in mathematics at the University of Niš and a rector of this university (2004–2006). In 2006 he was elected for a member of the Serbian Academy of Sciences and Arts (SASA), Belgrade. In 2008 he moved to Belgrade, where he is a Research Professor at the Mathematical Institute of SASA. His main contributions are in numerical analysis, approximation theory, special functions and polynomials. He has published about 300 scientific papers 5 monographs, 21 text books, and numerous expert papers. His known monographs are: *Topics in Polynomials: Extremal Problems, Inequalities, Zeros*, World Scientific Publ. Co., Singapore – New Jersey – London –Hong Kong, 1994 (with D.S. Mitrinović and Th.M. Rassias), and *Interpolation Processes – Basic Theory and Applications*, Springer Monographs in Mathematics, Springer – Verlag, Berlin – Heidelberg, 2008 (with G. Mastroianni).