

**GRADIMIR V. MILOVANOVIĆ – A MASTER IN  
APPROXIMATION AND COMPUTATION  
PART I**

*Themistocles M. Rassias and Miodrag M. Spalević*

This Special Issue of the journal *Applicable Analysis and Discrete Mathematics* is dedicated to the 70th birth anniversary of the eminent Serbian mathematician and Academician Professor Gradimir V. Milovanović. This Issue is split into two parts, with the first being published in 2019, and the second in 2020. Most of the papers featured within this Special Issue have been presented at the Mediterranean International Conference of Pure & Applied Mathematics and Related Areas in Antalya-Turkey, October 26–29, 2018.



Figure 1: Prof. Milovanović in his office at home

Prof. G. V. Milovanović, full member of the Serbian Academy of Sciences and Arts, was born in Zorunovac (Eastern Serbia) on January 2, 1948, to father Vukašin

and mother Vukadinka. He attended the primary school of his birthplace, and subsequently graduated from the high school of Natural-mathematical specialization in Knjaževac. He obtained a Bachelor's degree in Electrical Engineering and Computer Science in 1971, a Master's degree in Mathematics in 1974 and completed his Ph.D. in Mathematics in 1976 under the supervision of the eminent mathematical analyst Dragoslav S. Mitrinović (1908–1995) at the University of Niš. His thesis subject was devoted to functional inequalities and estimates of integral functionals. He became an Assistant Professor at the University of Niš in 1976 and he was gradually promoted to full Professor in 1986. Until July 2008 Milovanović served as a Professor at the University of Niš.



Figure 2: With his Professor D.S. Mitrinović (Belgrade, 1989)

We shall quote here Stojan Ristić, the well known emeritus Professor of the Faculty of Electronics at the University of Niš. He and Gradimir Milovanović have been students of the same generation, who attended the Faculty of Electronic Engineering in Niš from 1966 to 1971.

*“What I want to emphasize is that I (as well as other students) was fascinated by the knowledge that G. Milovanović had as a student, not only in subjects that required knowledge of Mathematics, but also in all other subjects. For the period 1971 to 2012, which constitutes the stretch of time I spent teaching at the Faculty of Electronic Engineering in Niš from assistant to full professor, I had an insight into all generations of students who attended that Faculty. Therefore, although there were more outstanding students whose names are known today in the world of science, I can confidently and proudly say that, in my opinion, Gradimir Milovanović was the best student of the Faculty of Electronic Engineering at the University of Niš for the period for which I am competent to state my position (from 1966 to 2012).”*

While at the University of Niš Gradimir Milovanović acted as the Head of the Department of Mathematics at the Electronic Engineering in Niš (1983–2002), Vice

Rector of the University of Niš (1989–1991), the Dean of the Faculty of Electronic Engineering in Niš (2002–2004), and the Rector of the University of Niš (2004–2006). In 2008, he moved to Belgrade, where he first served as Dean of the Faculty of Computer Science at Megatrend University (2008–2011), and then obtained a position at the Mathematical Institute of the SASA until his retirement in 2014. However, his scientific activities continue through the Serbian Academy of Sciences and Arts (SASA). In 2006, he was elected a Corresponding Member of the SASA, and subsequently in 2012 became a full member.

Milovanović has also obtained a number of distinguished positions, including being member of the board of the Mathematical Society of Serbia as well as President of the Scientific Council of the Mathematical Institute of SASA. He was vice President of the Scientific Society of Serbia (2002–2016), the President of the National Council of Serbia for Science and Technology Development (2006–2010), the President of the Scientific Committee for Mathematics, Computer Sciences and Mechanics (2010–2015), to name a few. He is also a member of several important international societies, among which are the AMS (American Mathematical Society), the SIAM (Society for Industrial and Applied mathematics) and the GAMM (Gesellschaft für Angewandte Mathematik und Mechanik). Since 2016 he is the Secretary of the Department of Mathematics, Physics and Geo Sciences in SASA (for detailed biographical and bibliographical data see: <http://www.mi.sanu.ac.rs/~gvm/>).

In his teaching career Professor G. V. Milovanović taught at the Electronics Faculty of Niš, as well as at other faculties in Serbia (Faculty of Electrical Engineering and Faculty of Mathematics in Belgrade, Faculty of Mechanical Engineering and Faculty of Civil Engineering in Niš, Faculty of Sciences and Mathematics in Niš, Kragujevac, etc.) He offered courses at all levels and on various topics, such as Numerical Analysis, Approximation Theory, Special Functions, Operation Research, as well as numerous subjects in the area of Computer Science and Information Technology. He was a visiting professor at Purdue University (USA), Université de Pau (France), and Università di Basilicata, Potenza (Italy). He has published 23 text-books, including the three volume treatise *Numerička analiza (Numerical Analysis)* (Naučna knjiga, Belgrade; with the first edition (1985) being the first complete text book on this subject in ex-Yugoslavia, which has been widely used by numerous generations of students in Serbia.)

He has supervised 13 Ph.D. Theses and 16 Master Theses, as well as many scientific research projects, including the international projects SCOPES and TEMPUS. He has acted as a reviewer of scientific projects for the Ministry of Science of Serbia, Italy and Montenegro. Furthermore, he has participated in doctoral theses committees as well as committees for the promotion of Professors in Serbia, France, Italy, Sweden, Romania, Cyprus, Morocco, Australia, and India.

Milovanović is the founder of the scientific journal *Facta Universitatis: Series Mathematics and Informatics* at the University of Niš and was its first Editor-in-Chief. He serves as a member of the Editorial Board as well as a referee of several international journals. Currently, he is the Editor-in-Chief of the journals: *Journal*

of *Inequalities and Applications* (Springer), *Publication Mathématique Belgrade*, *Bulletin (SASA)*; Associate Editor of the journals: *Optimization Letters* (Springer), *Annals of Functional Analysis* (Springer), *Applied Mathematics and Computation* (Elsevier), as well as a member of the Editorial Board of a number of journals in Serbia (*AADM*, *FILOMAT*, etc.), Romania, Bulgaria, Armenia and India.

He was an invited lecturer in numerous international conferences worldwide, e.g., in Bulgaria (Sofia, Borovec), in Germany (Oberwolfach), in Poland (Warsaw), in Hungary (Miskolc, Budapest), in the USA (Purdue University), in Romania (Cluj-Napoca, Timisoara), in Italy (Potenza, Vico Equense, Acquafredda di Maratea, Falerna, Erice, Alba di Canazei), in Singapore, in Norway (Røros), in Denmark (Copenhagen), in Spain (Granada, Seville, Ubeda), in South Africa (Stellenbosch, Port Elizabeth), in Morocco (Marrakech, Casablanca), in Brazil (Campos de Jodão), in South Korea (Gyeongju, Seoul), in France (Paris), in Sweden (Västerås), in Turkey (Antalya, Kirsehir, Kusadasi-Aydin, Istanbul), etc.



Figure 3: With Prof. W. Gautschi (Purdue University, March 2018)

Milovanović has published 7 monographs and about 350 scientific papers (over 150 in journals from the SCI list), with several thousand citations. Among the most significant monographs of Milovanović are *Topics in Polynomials: Extremal Problems, Inequalities, Zeros* (with D. S. Mitrinović and Th. M. Rassias), exceeding 800 pages, published by World Scientific (Singapore, 1994), which is now known in the academic community as the “Bible of Polynomials”, as well as the monograph *Interpolation Processes – Basic Theory and Applications* (with G. Mastroianni) by Springer Verlag, 2008. His scientific work extends over several subjects of Numerical

Analysis and Approximation Theory, where he has contributed significant results on orthogonal polynomials and systems on the real line and complex plane, special functions, extremal problems, analytic inequalities, approximations by polynomials and splines, as well as in interpolation and quadrature processes, including the summation of slowly convergent series. His research work and publishing activity as author/coauthor and editor/coeditor is devoted to a large spectrum of areas of Pure and Applied Mathematics, and he has collaborated with a number of eminent mathematicians from the international community. His huge amount of work has received a lot of international recognition. His work is also credited with the term “Gautschi-Milovanović method”.

The Preface in Part II of this Special issue of the journal *Applicable Analysis and Discrete Mathematics* will be devoted to an analysis of Milovanović’s scientific results.



Figure 4: Prof. Milovanović (Paris, 2015)

In this volume the following contributions of Gradimir’s friends and collaborators are featured:

The paper by Caddik and Süli is concerned with the numerical approximation of Young measure solutions to initial-boundary-value problems for nonlinear multidimensional parabolic systems of forward-backward type, where the existence of a weak solution cannot be guaranteed in general, because the nonlinearity in the equation is neither monotone, nor globally Lipschitz, nor indeed is it the gradient of a potential; In his paper Lubinsky considers orthogonal Dirichlet polynomials with constant weight; The paper by Govil and Kumar is devoted to sharpening an inequality of Turán; The paper by Alabdali, Guessab and Schmeisser is concerned with characterizations of uniform convexity by conditions in terms of the

gradient or the Hessian matrix of the considered function for certain classes of moduli  $\phi$ ; In the paper by Mutavdžić, Pejčev and Spalević the rigorous error bounds of Gauss-Lobatto quadratures, for weight functions of Bernstein-Szegő type and for integrands analytic on confocal ellipses, are considered; The authors Rassias, Agarwal, Rani and Chand consider certain Feynman type integrals involving the generalized  $k$ -Mittag-Leffler function and general class of polynomials; Bayad and Seddik investigate arithmetic properties of the common indices of algebraic integers in cubic fields; Kucukoglu and Y. Simsek consider identities for Dirichlet and Lambert-type series arising from the numbers of a certain special word; The paper by T. Kim, D.S. Kim and Jang is concerned with central complete Bell polynomials; Saker, Osman and Krnić establish some new reverse dynamic inequalities and use them to prove some higher integrability theorems for decreasing functions on time scales; The purpose of the paper by Buket Simsek is to provide some identities derived by moment generating functions and characteristics functions; The paper by A. Pant, R.P. Pant and Rakočević is concerned with Meir-Keeler type and Caristi type fixed point theorems; The paper by Karapinar is concerned with revisiting simulation functions via interpolative contractions; Burcin Simsek and Iyengar consider the problem of computing tail probabilities, that is, probabilities of regions with low density, for high-dimensional Gaussian mixtures; Jakšetić presents a technique of how to produce completely monotone functions using linear functionals and already known families of completely monotone functions, and then, using mean value theorems, he constructs means of Cauchy type that have monotonicity properties; Asymptotic expansions of the gamma function are studied and new accurate approximations for the factorial function are given by Burić in his paper; The paper by Guessab, Driouch and Nouisser is concerned with a globally convergent modified version of the method of moving asymptotes; Finally, Savas considers  $A$ -statistical convergence of order  $\alpha$  via  $\varphi$ -function.

We wish to express our warmest thanks to all the mathematicians who have contributed their papers, and to all the referees for their assistance on judging the merits of the submissions as well as for their useful comments and propositions, which led to the composition of this Special Issue dedicated to the 70th birth anniversary of the academician Professor Gradimir V. Milovanović.

#### Guest Editors of the Special Issue:

**Themistocles M. Rassias**

Department of Mathematics

National Technical University of Athens (Greece)

E-mail: *trassias@math.ntua.gr*

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**Miodrag M. Spalević**

Department of Mathematics

Faculty of Mechanical Engineering, University of Belgrade (Serbia)

E-mail: *mspalevic@mas.bg.ac.rs*