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PROFESSOR GROZDANOVIC'S PROFESSIONAL CONTRIBUTIONS IN ERGONOMICS

Evica Stojiljkovic
Uuniversity of Nis, Faculty of Occupational Safety, Nis, Serbia
evica.stojiljkovic@znrfak.ni.ac.rs

Special Issue in Honors of Professor Miroljub Grozdanović

Guest Editor's Note

This special issue of the ***IETI Transactions on Ergonomics and Safety*** is dedicated to Professor Miroljub Grozdanović who celebrated his 75th birthday in June 2022 year. Professor Grozdanović has had a distinguished career in Ergonomics, with over 40 years of experience in applying ergonomics theory and methods in a diverse set of domains. The basic scientific preoccupation of Professor Grozdanović in his abundant research activities was the ergonomic design of management and control centers of automated systems and the methodological directions of ergonomic scientific thought development. Such orientation was initiated by the increased application of automation in energetic, mine and transportation spheres of human activities, which conditioned significant elaboration of theoretical-methodological and practical ergonomic problems related to human activities, being that the provision of their high efficiency and functionality represents a vital factor of increased efficiency, functionality and development of the systems of automated-system control and management. In addition to these basic research fields, he is engaged in the problems of human reliability and human error, in quality management of working and living environment, that is the automation and human factor, in bio-cybernetic relations in the man-machine system, in human reengineering of work, in professional risk assessment, mathematical modeling of human activity, ergonomic standardization and ergonomic design of products.

Professor Grozdanović is a full professor at the Faculty of Occupational Safety, University of Niš. He is the author of 247 scientific papers, of which 3 monographs, 2 textbooks, 13 works of international monographs, published in 28 international journals, 22 national journals, at 70 international conferences, and 107 national conferences. He was a mentor of 2 doctoral dissertations, 3 master's theses, and 19 graduate diploma theses, and a member of the thesis committee for the defense of 8 doctoral dissertations, 4 master's theses and 10 graduate diploma theses. He was a reviewer of many books and scientific papers. He was the president and member of 19 program committees of important scientific conferences. He managed 2 and was a member of 6 scientific projects. He has also managed several professional projects. He formed a significant program in undergraduate, master, and doctoral studies in the field of ergonomics. He made a significant contribution to the promotion of the University of Nis on a national and international level. He has been a regular member of the Engineering Academy of Serbia since 2000. He was the president of the scientific council of the Ergonomic Society of RF Yugoslavia, the president of the Ergonomic Society of FR Yugoslavia (later Serbia), a member of the Commission for Ergonomic Standards of the Federal

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Institute for Standardization, a member of the Publishing Council of the journal *Preventive Engineering*, a member of the Editorial Board of the journal *Facta Universitatis, Series Working and Living Environmental Protection.* He was a member of the Republic Council for Higher Education and a delegate to the Conference of the University of Serbia. He was also a member of the National Science Council and the Senate of the University of Nis, and a member of the Board he also performed significant management functions at the University (Dean, Vice-Rector, Rector) and in the industry (Assistant, Deputy and Advisor to the General Manager of EI Holding Corporation; Assistant General Manager of Elektrotehna, Niš, etc.). He was a president and member of 19 scientific and industrial organizations Committees in Serbia. Achieved results in the field of science, management of complex industrial systems, and higher education classify Professor Grozdanović as one of the world's leading experts in these fields.

Finally, the guest editor of this special issue of **IETI Transactions on Ergonomics and Safety** would like to add some personal notes, since she worked with Professor Grozdanović for a long time. First, as the best student of the Faculty in 2000/2001, she was elected as a teaching assistant on courses formed and taught by Professor Grozdanović, and then under his mentorship, he obtained a master's and doctoral degree. During that period, they published a significant number of scientific papers published by significant international journals, and numerous participations in national and international conferences. This cooperation has continued to this day, in which, even after the retirement of Professor Grozdanović, they published a monograph, textbook, and significant scientific papers, as a result of many years of scientific research. Working together has enabled many generations of students to receive a high-quality education in the scientific fields they have presented.

The guest editor would like to thank all authors of the papers who have accepted to contribute to this special issue of **IETI Transactions on Ergonomics and Safety.**

Brief career details

Prof. dr Miroljub Grozdanović was born on June 2, 1947, in Leskovac. He completed his elementary and secondary education (High School – Department of Science and Mathematics) in Leskovac and graduated from the Faculty of Electronic Engineering, Department of Digital Engineering in Niš. He defended his master's thesis, titled "Ergonomic research of functional suitability of the dispatcher-operator's workplace in the system of railway traffic remote operation in the country", in 1987 at the Faculty of Occupational Safety in Niš, and was admitted to the M.Sc. degree in Occupational Safety. His doctoral dissertation under the title "The Research of the Coordination between a Men-operator and Information Control Equipment in Control Centres" he defended in March 1989 at the Faculty of Electrical Engineering and Computer Science in Ljubljana, having thus acquired the academic title of a D.Sc. in Electrical Engineering.

Upon graduation, Prof. Miroljub Grozdanović was performing the following jobs: a development engineer in the Electronic Industry – Component Parts Plant; the investment programs manager in Iskra Commerce Ljubljana – the Niš Branch; the assistant general manager in TP "Elektrotehna" Niš; the assistant general manager for development and research, later the general manager deputy in EI Holding Corporation and Advisor to the General Manager.

He participated as a member in the following management bodies: the Management Board of the Faculty of Occupational Safety in Niš, the Management Board of the Ergonomic Society of FR

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Yugoslavia; the Management Board of TP "Elektrotehna"; the Management Board of EI "Elektromedicina"; the Management Board of EI "Component Parts"; the Assembly of the Association of Engineers and Technicians of Yugoslavia; the Republic Council of Safety; the Republic Council of High Education, the Development Committee of the Chamber of Commerce of Yugoslavia and president of management board EI R&D Institute Nis and president of management board EI "Informatika".

Within the Faculty of Occupational Safety, in 1994, he was elected the assistant professor for the subject "Ergonomic Design", in 1995 he entered part-time and in 1997 full-time employment. He was engaged in the subjects "Ergonomic Design", "Systems of Fire Detecting and Reporting" and "Living Environment Quality Planning and Control". He has been teaching Ergonomics at the postgraduate studies of the faculty continually since the 1996/97 academic year.

He was a mentor of 2 doctoral dissertations, 3 master's theses, and 19 graduate diploma theses, and a member of the thesis committee for the defense of 8 doctoral dissertations, 4 master's theses, and 10 graduate diploma theses.

He held the position of Faculty Dean (2002-2004) and vice Rector of the University of Niš (2004-2006). He was elected the full professor, in April 2002. He visited a significant number of university centers in Europe, North America, and Asia and established active scientific and professional cooperation with many ergonomic scientific associations of these countries.

He was the chairman of the following scientific sessions of world congresses and international symposia: Session "Musculoskeletal Disorders", XV Triennial Congress of the International Ergonomics Association, Seoul, Korea, 2003, Session "Safety", XV Triennial Congress of the International Ergonomics Association, Seoul, Korea, 2003, Session 8, 3rd International Symposium of Industrial Engineering, University of Belgrade, 2001, Session "Human Being Factors", 1st International Symposium of Industrial Engineering, University of Belgrade, 1996. He was the president or member of program boards of numerous scientific and professional meetings in the country and abroad.

The basic scientific preoccupation of Prof. Miroljub Grozdanović in his abundant research activities was the ergonomic design of management and control centers of automated systems and the methodological directions of ergonomic scientific thought development. Such orientation was initiated by the increased application of automation in energetic and transportation spheres of human activities, which conditioned significant elaboration of theoretical-methodological and practical ergonomic problems related to human activities, being that the provision of their high efficiency and functionality represents a vital factor of increased efficiency, functionality and development of the systems of automated-system control and management.

In addition to these basic research fields, he is engaged in the problems of human reliability and human error, in quality management of working and living environment, that is the automation and human factor, in bio-cybernetic relations in the man-machine system, in human reengineering of work, in professional risk assessment, mathematical modeling of human activity, ergonomic standardization and ergonomic design of products.

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He was the principal investigator in the scientific projects: “Research and development of expert systems and methods for ergo-ecological risk assessment of accident in Electric Power Industry of Serbia”, TR 21030, 2008-2010., Ministry of Science and Technological Development and “Research and development of the equipment and software for the reengineering of the monitoring, diagnostics, management and safety of underground works in coalmines”, Ministry of Science, Technology and Development of the Republic of Serbia, 2002-2003, and he participated in the following scientific projects: “Research of new technologies and methods of energetic mineral raw materials exploitation, equipment and management systems aimed at their rational usage”, Ministry of Science, Technology and Development of the Republic of Serbia, 1996-2000; “Theoretical, model and experimental research of the management systems of energetic mineral raw materials exploitation complexes”, sub-project, Ministry of Science, Technology and Development of the Republic of Serbia, 1996-2000; “Research of new methods and improvement of systems of the exploitation, preparation and transport of crude oil, natural gas and geothermal energy”, sub-project, Ministry of Science, Technology and Development of the Republic of Serbia, 1996-2000; “Development of systems for gas refinement from small-power emission sources”, Ministry of Science, Technology and Development of the Republic of Serbia, 2002-2003; “Development of higher education quality assurance system for Serbia”, Tempus Project, JEP 17040-10/05WG5, 2003-2006. Implementation of ECTS at Universities in Serbia, Tempus Project, CSM C009B04, 2005-2007. He was head of projects for risk assessment in the ED PD “Jugoistok” d.o.o Niš, PD ED “Centar” d.o.o Kragujevac and JP “Elektrokosmet” Kosovska Mitrovica.

Prof. Miroljub Grozdanović is a member of the Yugoslav academy of engineering. He was president of the Ergonomics Society of Serbia, a member of Yugoslav Country for standardization, a member of the Council of International Ergonomics Association, President of the Department for system safety and risk research and manager of “Centres for research in Electric Power Industry” on Faculty of Occupational Safety in Niš. He was the president of the program committee of the scientific-professional conference Ergonomics 2007 and a member of the program committee of the scientific-professional conference Ergonomics 1996, 1998, 2000, 2002, a member of the program committee of the conference with international participation “Technical systems and means of fire, explosion, breakdown”, 1999, member of the program committee of the conference with international participation “Preventive engineering and insurance of motor vehicles, vehicles, systems and equipment”, 2000, member of the program committee of the conference with international participation “Risk management and insurance in industry, transport and storage”, 2001, member of the program committee of the 3rd International Symposium of Industrial Engineering, 2001, member of the program committee of the conference with international participation “Systematic analysis of economic damage, insurance and preventive engineering”, 2002, member of the program committee of the conference with international participation “Fire, explosion, accident risk and burglary in insurance and organization of protection systems”, 2003, member of the scientific department Bora IV International Symposium “Mining and Environmental Protection”, 2003, Member of the Program Committee of the XIII Scientific Conference “Man and the Working Environment”, 2005, Member of the Program Committee of the International Conference “Human Aspects of Advanced Manufacturing”, 2004, member of the program committee of the International Conference “Applied Human Factor and Ergonomics”, 2010, member of the program committee of the 6th International Symposium on Industrial Engineering - CEE 2015, member of the program committee of the European Safety and Reliability Conference ESREL 2017 and others.

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He was a reviewer for the books: Ergonomics Design for Healthy and Productive Workplace, by Alan Hedge; Technology and Safe Workplaces: Attributes of a Prosperous Society, by Juraj Sinay; Human Reliability Assessment, by Evica Stojiljković; Ergonomic Risk, by Sonja Pavlovic-Veselinović; Mechanic, by Slavka Mitić, and Local Agenda 21: An Introduction to Sustainable Development Planning, by Slobodan Milutinović and international journals: Safety Engineering; Cognition, Technology and Work; Quality and Reliability Engineering International; Facta Universitatis, Series "Working and Living Environmental Protection.

He is the author of 247 scientific contributions in ergonomics.

13 published in international monographs: A. C. Bittner, P. C. Champney (Eds.) - *Advances in Industrial Ergonomics and Safety* No. VII. London: Taylor & Francis; P. A. Scott, R. S. Bridger, I. Charteris (Eds.)- *Global Ergonomics* (first edition). Amsterdam – Lansanne – New York – Oxford – Shannon – Singapore – Tokio: Elsevier; G. Lee (Ed.) - *Advances in Industrial Ergonomics and Safety XI*, London: Taylor & Francis.W. Karwowski, R. Goonetilleke (Eds.) - *Manufacturing Agility and Hybrid Automation – II*, IEA Press; D. Koradeska, W. Karwowski and B. Das (Eds.) - *Ergonomics and Safety for Global Quality and Productivity*. Warszawa: Central Institute for Labour Protection; T. Marek and W. Karwowski (Eds.) - *Manufacturing Agility and Hybrid Automation - III*. Krakow, Poland: Jagiellonian University; D. Koradeska, W. Karwowski and B. Das (Eds.) - *Ergonomics and Safety for Global Quality and Productivity*. Warszawa: Central Institute for Labour Protection; Halimahtun Khalid, Alan Hedge, and Tareq Z. Ahram (Eds.) - *Advances in Ergonomics Modeling and Usability Evaluation* Boca Roton: CRC Press.

28 published in world-known scientific journals. 26 published in SCI journals: *Safety Science*; *Quality and Reliability Engineering International*; *International Journal of Industrial Ergonomics; International Journal of Occupational Safety and Ergonomics*; *Journal of Scientific & Industrial Research*; *Didactica Slovenica: Pedagoška obzorja*; *International Journal of Mining, Reclamation and Environment*; *Metalurgia International; Acta Montanistica Slovaca; Work - A Journal of Prevention Assessment & Rehabilitation; Human and Ecological Risk Assessment: An International Journal*; *Measurement and Control*; *Transactions of the Institute of Measurement and Control*; *Cognition, Technology & Work*; *International Arab Journal of Information Technology (IAJIT)*; *Aircraft Engineering and Aerospace Technology*; *Surgical Innovation*; *Human Factors and Ergonomics in Manufacturing*; *International Journal of Injury Control and Safety Promotion; Process Safety Progress*; *South African Journal of Industrial Engineering.*

70 were presented in international conferences. Scientific papers have been presented and published in full in the Proceedings of international scientific conferences held around the world (on 4 continents). The following is an overview of conference venues that do not include venues in the countries of the former Yugoslavia: Tampere, Finland; Praha, Czech Republic; Ann Arbor, USA; Hong Kong, China; Yokohama, Japan; Poznan - Wroclaw, Poland; Keptaun, South Africa; Halkidiki, Greece; New York, USA; Wuppertal, Germany; Barcelona, Spain; Kosice, Slovakia; Warsaw, Poland; Благоевград, България; San Diego, USA; Beijing, P. R. China; Dalian, China; Seoul, Korea; Funchal, Madeira, Portugal; Guwahati, India; Las Vegas, USA; San Diego, USA; Bhopal, India; Pune - Maharashtra, India; Miami, USA.

22 published in domestic journals, 107 were present at domestic conferences, etc.

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The publication history from 1980 to 2020 is shown in Fig.1., Fig.2., Fig.3., Fig. 4., Fig. 5., Fig. 6.

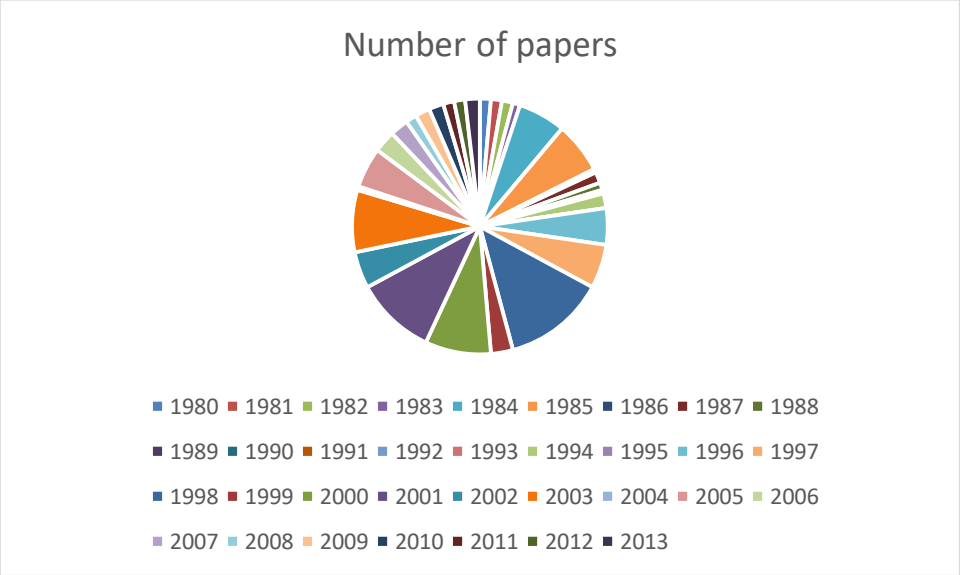

Figure 1. Number of scientific results and M points per year in the period 1980-2013.

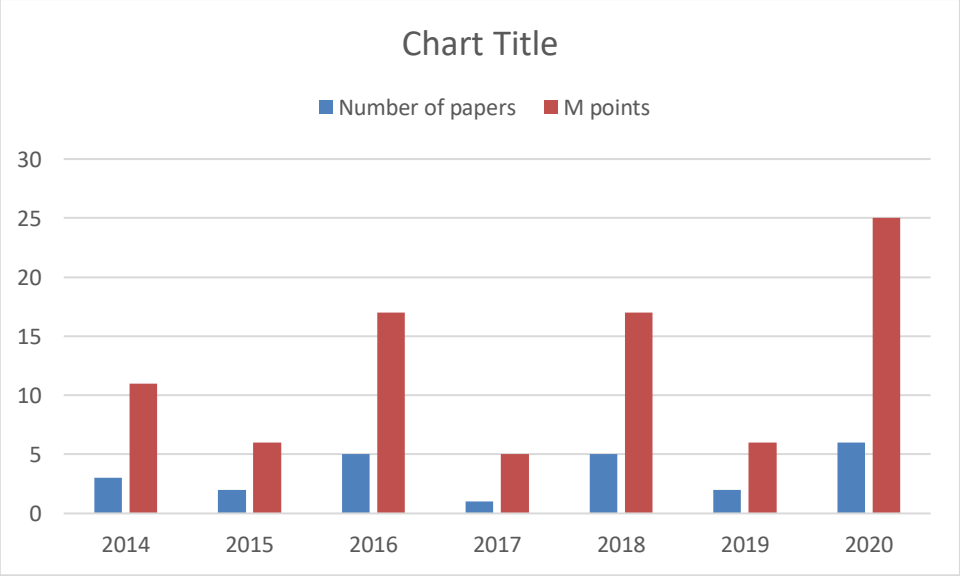

Figure 2. Number of scientific results and M points per year in the period 2013-2020.

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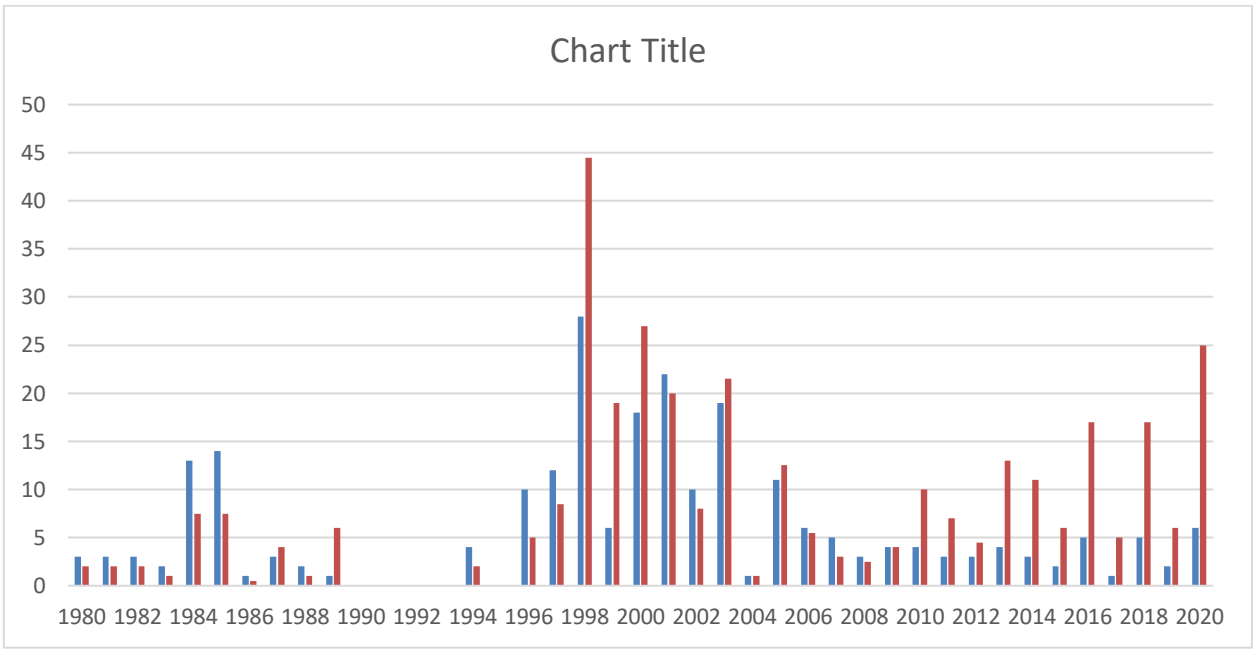

Figure 3. Number of scientific results and M points per year in the period 1980-2020.

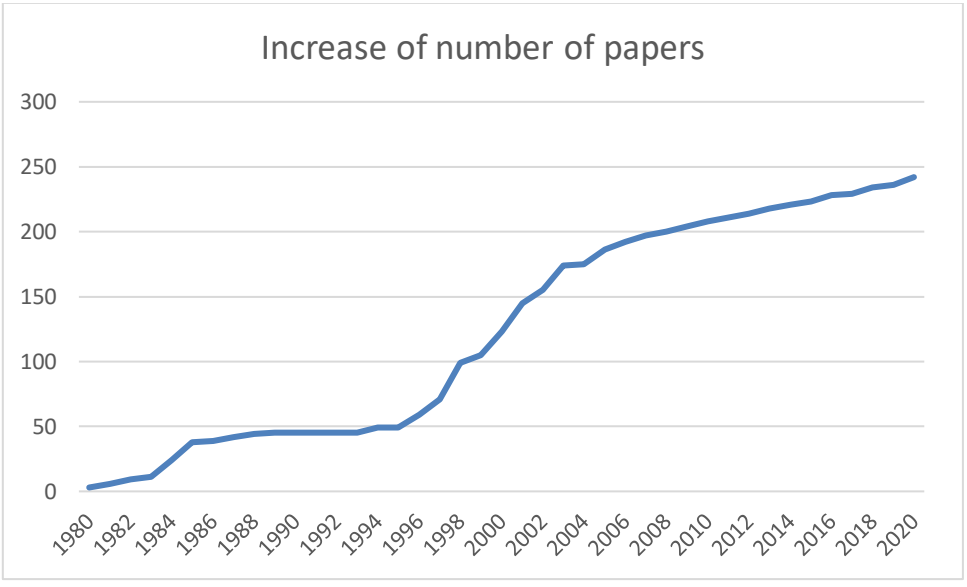

Figure 4. Increase in the number of scientific papers and M points in the period 1980-2020.

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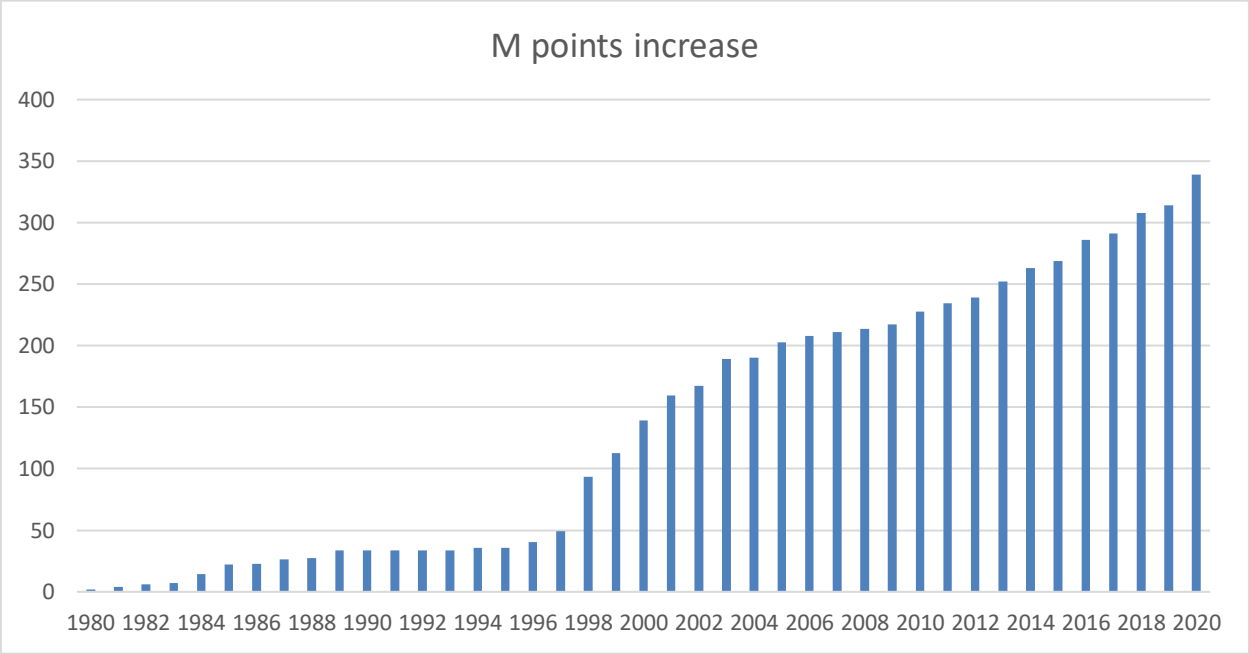

Figure 5. Total number of scientific papers and M points by categories of papers (M10-M70) for the period 1980-2020.

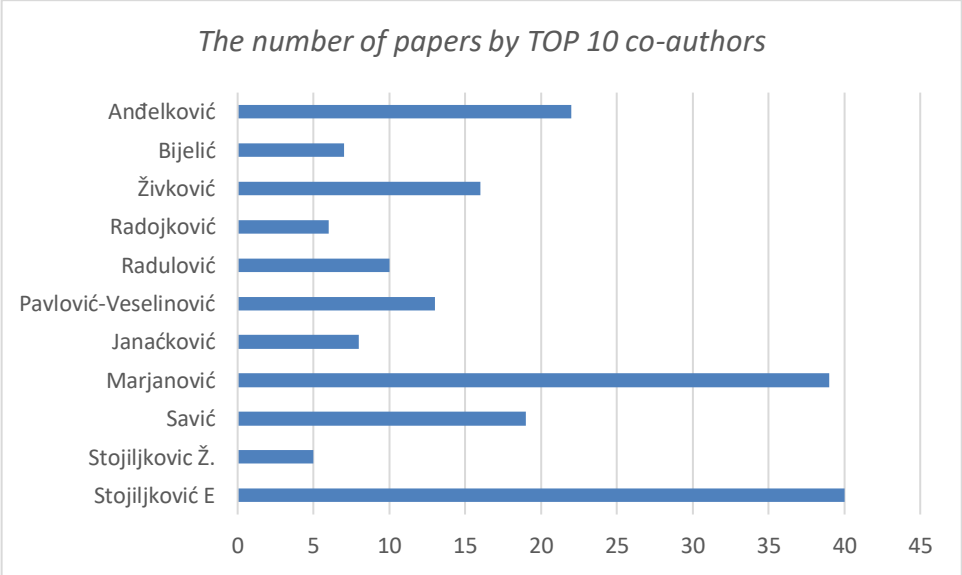

Figure 6. Graphic presentation of the number of papers by TOP 10 co-authors.

According to the Science Citation Index database, Professor Grozdanovic's works have been cited (Google Scholar 259, Research Gate 153 and Scopus 108) in the world-leading scientific journals. Also, his scientific papers have been cited in a large number of monographs, doctoral dissertations, master thesis, and textbooks.

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The most cited papers according to the Web of Science:

1. Janackovic, G., Stojiljkovic, E., **Grozdanovic, M.** (2020). Selection of Key Indicators for the Improvement of Occupational Safety System in Electricity Distribution Companies. *Safety Science*, 125, 103654.
2. **Grozdanovic, M**., Bijelić, B., Marjanovic, D. (2018). Impact Assessment of Risk Parameters of Underground Coal Mining on the Environment. *Human and Ecological Risk Assessment*, 24 (4), 1003-1015.
3. **Grozdanovic, M.**, Janackovic, G. (2018). The Framework for Research Operators' Functional Suitability and Efficiency in the Control Room. *International Journal of Industrial Ergonomics*, 63, 65-74.
4. **Grozdanovic, M.**, Janackovic, G., Stojiljkovic, E. (2016). The Selection of the Key Ergonomic Indicators Influencing Work Efficiency in Railway Control Rooms. *Transactions of the Institute of Measurement and Control*, 38 (10), 1174-1185.
5. **Grozdanović, M.**, Janaćković, G. (2016). The Development of a New Integral Control Model Based on the Analysis of Three Complex Systems in Serbia, *Cognition, Technology & Work*, 18 (4), 761-776.
6. Stojiljkovic, E., Janackovic, G., **Grozdanovic, M.**, Savic, S., Zunjic, A. (2016). Development and Application of a Decision Support System for Human Reliability Assessment – a Case Study of an Electric Power Company. *Quality and Reliability Engineering International*, 32 (4), 1581-1590.
7. Stojiljkovic, E., Glisovic, S., **Grozdanovic, M.** (2015). The Role of Human Error Analysis in Occupational and Environmental Risk Assessment: a Serbian Experience. *Human and Ecological Risk Assessment: An International Journal*, 21 (4), 1081-1093.
8. Stojiljkovic, E., **Grozdanovic, M.**, Marjanovic, D. (2014). Impact of the Underground Coal Mining on the Environment. *Acta Montanistica Slovaca*, 19 (1), 6-14.
9. **Grozdanovic, M.**, Jekic, S., Stojiljkovic, E. (2014). Methodological Framework for the Ergonomic Design of Children's Playground Equipment – a Serbian Experience. *Work - A Journal of Prevention Assessment & Rehabilitation*, 48 (2), 273-288.
10. **Grozdanovic, M.**, Savic, S., Marjanovic, D. (2013). Assessment of Key Factors for Ergonomic Design of Management Information Systems in Coal Mines, *International Journal of Mining, Reclamation and Environment*, 29 (2), 99-111.