Three Fuzzy Problem(s)

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Abstract: It is a well-known fact that imprecision and uncertainty are characteristics inherent to real life and can complicate the construction of classical mathematical models that describe phenomena in the real world designed to aid decision-making processes.

Fuzzy theory, grounded in the seminal work of Lotfi Zadeh from 1965 titled "Fuzzy Sets," represents a modern mathematical approach to addressing this issue. Reflecting on the famous statement by John von Neumann, "If people do not believe that mathematics is simple, it is only because they do not realize how complicated life is.", this fuzzy approach serves as the necessary bridge to translate life's complexity into the simplicity of mathematics.

The topic of this presentation is the concept of "fuzzy". Specifically, "fuzzy" in sets, i.e., fuzzy sets, "fuzzy" in set functions, i.e., fuzzy measures, "fuzzy" in integrals, i.e., general fuzzy integrals, and their synergy and application in real-world environments.

Short Bio:

Education: Graduated in Mathematics in 1996 at Faculty of Sciences, University of Novi Sad; M.Sc. in Mathematics in 1999 at Faculty of Sciences, University of Novi Sad; Ph.D. in Mathematics, in 2001 at Faculty of Sciences, University of Novi Sad.

Employment: Full professor at Department of Mathematics and Informatics, Faculty of Sciences, University of Novi Sad, Serbia, since June the 25th 2015.

Previous positions: Ivana Štajner-Papuga held position of a junior teaching assistant from December 1996 till 2000, and a teaching assistant from 2000 till 2002. From 2002 till 2007, she held position of an Assistant Professor and from 2007 till 2015 a position of an Associate Professor. All positions were at Department of Mathematics and Informatics, Faculty of Sciences, University of Novi Sad, Serbia.

Mobility: Visiting Researcher at University Johannes Kepler, Linz, Austria, in November 2001, November 2002, November 2003 and November 2004; Visiting Researcher at Sapienza-Universita di Roma, Roma, Italy, in May 2007; Erasmus teaching mobility grant at University of Graz, Graz, Austria, in April 2019; CEEPUS teaching mobility grant at University of Plovdiv, Faculty of Mathematics and Informatics, in April 2024.

Conferences: Ivana Štajner-Papuga participated with presentations in over 40 international conferences and was the Technical Program Committee Chair for IEEE International Symposium on Intelligent Systems and Informatics from 2013 for 10 years.

Fields of interest: Fuzzy Systems; Decision Making Theory; Aggregation Operators; Measure Theory - non-additive set functions; applications; Statistics.

Ivana Štajner-Papuga is a *Reviewer* for the following international journals: Fuzzy Sets and Systems, Knowledge-Based Systems, Journal of Inequalities and Applications, Soft Computing, Information Sciences, Fuzzy Optimization and Decision Making, ComSIS, International Journal of Fuzzy Systems, Iranian Journal of Fuzzy Systems, etc. Also, together with Márta Takács, she was Guest Editors of Special Issue on Focusing on Intelligent Systems, Acta Polytechnica Hungarica 18, No9, 2021.

Number of papers: 67 (SCOPUS, June 2024)

h-index: 12 (SCOPUS, June 2024)

Citations: number of citations with all authors excluded is 232, number of citations with Ivana Štajner-Papuga exclude is 291, total number of citations is 416 (SCOPUS, June 2024)

Projects:

- Project number 174009 funded by The Ministry of Education, Science and Technological Development* of the Republic of Serbia, titled "Mathematical Models of Nonlinearity, Uncertainty and Decision Making" (2011-2019) – participant.
- Project number 142-451-2838/2017-01 funded by the Provincial Secretariat for higher education and scientific research, Autonomous Province of Vojvodina, Republic of Serbia, titled "Mathematical tools for decision making processes" (2017) – chair.
- Project number 142-451-3642/2017-01 funded by the Provincial Secretariat for higher education and scientific research, Autonomous Province of Vojvodina, Republic of Serbia, titled "Computational intelligence and relational equations in forensics" (2018) – participant.
- DigForAsp (Digital forensics: evidence analysis via intelligent systems and practices) CA17124 funded by the European Cooperation in Science and Technology (COST) – participant.
- InAMath - An interdisciplinary approach to mathematical education (https://inamath.uniri.hr/about-project/), Erasmus+ program (2020-2023) – participant
- Project number 142-451-3090/2023-01 funded by the Provincial Secretariat for higher education and scientific research, Autonomous Province of Vojvodina, Republic of Serbia, titled "Fuzzy systems in Bayesian analysis" (2023) – chair.
- Project number 6565 by the Science Fund of the Republic of Serbia, titled "Advanced Techniques of Mathematical Aggregation and Approximative Equations Solving in Digital Operational Research- AT-MATADOR" (2023 - ongoing) – participant.
- EUGLOH 2.0 – Academic representative of University of Novi Sad for WP2, 2023 – ongoing.
- CEEPUS HU-0028-17-2324 - Active Methods in Teaching and Learning Mathematics, Informatics and their Applications – contact person for Department of Mathematics and Informatics, Faculty of Sciences, University of Novi Sad