Jelena Ignjatović - Curriculum Vitae

Personal data:

Date and place of birth:
July 30, 1973, Niš, Serbia

Address:
University of Niš
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Scopus Author ID: 22634539100

Education:

BSc: 1997, Mathematics
Faculty of Philosophy, University of Niš, Niš, Serbia

MSc: 2000, Mathematics
Faculty of Philosophy, University of Niš, Niš, Serbia
MSc thesis: Decompositions of quasi-ordered sets, semigroups and automata (in Serbian)
Thesis supervisor: Miroslav Ćirić

PhD: 2007, Computer Sciences
Faculty of Sciences and Mathematics, University of Niš, Niš, Serbia
PhD thesis: Fuzzy relations, automata and languages (in Serbian)
Thesis supervisor: Miroslav Ćirić

Professional Experience:

1999-2000 – Junior Teaching Assistant,
Faculty of Faculty of Philosophy, University of Niš, Serbia

2000-2001 – Teaching Assistant,
Department of Mathematics, Faculty of Philosophy, University of Niš, Serbia

2001-2008 – Teaching Assistant,
Department of Mathematics, Faculty of Sciences and Mathematics, University of Niš, Serbia

2008-2012 – Assistant Professor,
Department of Computer Science, Faculty of Sciences and Mathematics, University of Niš, Serbia

2012-2016 – Associate Professor,
Department of Computer Science, Faculty of Sciences and Mathematics, University of Niš, Serbia

2016 – Full Professor,
Department of Computer Science, Faculty of Sciences and Mathematics, University of Niš, Serbia

Professional Positions:

- Vice-Dean for Coordination of International Projects, Faculty of Sciences and Mathematics, University of Niš (2015 – present)
- Member of the University Council (2019 – present)

Current Teaching:

Bachelor's Degree Courses:

- *Mathematical Logic and Set Theory* (Mathematics)
- *Data structures and agorithms* (Computer Science)

Master's Degree Courses:

- *Criptographic Algorithms* (Computer Science)
- *Theory of Algorithms, Automata and Languages* (Computer Science)

Ph.D. Degree Courses:

- *Formal Languages, Automata and Computability* (Computer Science)
- *Fuzzy sets and Systems* (Mathematics, Computer Science)
- *Ordered Sets and Lattices* (Mathematics, Computer Science)
- *Fuzzy Sets and Systems* (Mathematics, Computer Science)
- *Ordered Algebraic Structures* (Mathematics)

Previous Teaching:

Many courses at the undergraduate and graduate levels:

Algebra II (including *Theory of Groups*, *Theory of Rings and Fields*, etc.), *Linear Algebra and Analytical Geometry, Methodology of e-learning, Integrated software packages, Theory of Languages and Automata,* etc.

Scientific and Professional Orientation:

- ***MATHEMATICS***
  - ***Algebra, Mathematical Logic, Applied Mathematics,***
    - ***Fuzzy Sets and Systems, Ordered Sets and Lattices, Theory of Semigroups, Theory of Rings, Theory of Semirings, Universal Algebra, Linear Algebra, Social Network Analysis, Generalized Inverses;***
- ***COMPUTER SCIENCE***
  - ***Theory of Computing, Artificial Intelligence,***
    - ***Automata, Formal Languages, Reasoning under Uncertainty.***

Current & Recent Research Interests:

Fuzzy relations and fuzzy relation equations:

Fuzzy equivalences, fuzzy quasi-orders, uniform fuzzy relations, fuzzy relation inequalities, fuzzy relation equations, applications of fuzzy relation inequalities and equations, etc.

Fuzzy automata and languages:

Algebraic theory of fuzzy automata and languages, state reduction algorithms, simulation, bisimulation and structural equivalence, determinization algorithms, canonization algorithms, fuzzy regular expressions and their conversion to fuzzy automata, applications to discrete event systems, etc.

Weighted automata:

Weighted automata over semirings, especially over additively idempotent semirings, weighted automata over strong bimonoids, determinization algorithms, state reduction algorithms, simulation, bisimulation and structural equivalence, weighted regular expressions, etc.

Nondeterministic automata:

Nondeterministic automata, determinization algorithms, canonization algorithms, state reduction algorithms, simulation, bisimulation and structural equivalence, etc.

Social network analysis

Fuzzy networks, one mode networks, two-mode networks, multi-mode multi-relational networks, regular fuzzy equivalences, regular fuzzy quasi-orders, blockmodeling, bisimulations.

Ordered algebraic structures

Residuated functions, residuated algebraic structures, residuated lattices and quantales, solving inequalities and equations defined by residuated functions, solving inequalities and equations in residuated structures, etc.

Generalized inverses

Moore-Penrose equations in involutive residuated semigroups and involutive quantales, outer inverses in semigroups, generalized inverses of fuzzy matrices, etc.

Former Research Interests:

Deterministic automata:

Direct sum decompositions, subdirect decompositions, reversible states, transition semigroups, etc.

Ordered sets and lattices:

Quasi-ordered sets, direct sum decompositions, distributive and algebraic lattices, lattices of congruences, ideals, subalgebras and varieties, etc.

Publications:

- 39 publications, including 1 research monograph, 1 text-book, and 35 peer-re-viewed research articles published in scientific journals, conference proceedings, and book chapters
- most of the articles have been published in the highest ranked international scientific journals: Fuzzy Sets and Systems, Information Sciences, IEEE Transactions on Fuzzy Systems, Knowledge-Based Systems, Journal of Intelligent Manufacturing, Journal of Computer and System Sciences, Theoretical Computer Science, Soft Computing, and others
- they have also been cited mostly in the top ranked journals
- Citations: *Google Scholar*: 991, *Scopus*: 575, *Web of Science*: 536
- H-index: *Google Scholar*: 18, *Scopus*: 15, *Web of Science*: 15

Participation in Research Projects:

- ***Methods and Models in Theoretical, Applied and Industrial Mathematics: Algebra 04M03*** (1998-2000)
  Funded by: Ministry of Science and Technological Development, Republic of Serbia
  Project holder: Mathematical Institute of the Serbian Academy of Science and Arts, Belgrade
  Project leader: Stojan Bogdanović (University of Niš)
- ***Algebraic and Combinatorial Methods in Information and Communication Technologies - 101227*** (2002-2005)
  Funded by: Ministry of Science and Technological Development, Republic of Serbia
  Project holder: Faculty of Sciences and Mathematics, University of Niš
  Project leader: Miroslav Ćirić
- ***Algebraic Structures and Information Processing Methods - 144011*** (2006-2010)
  Funded by: Ministry of Science and Technological Development, Republic of Serbia
  Project holder: Faculty of Sciences and Mathematics, University of Niš
  Project leader: Miroslav Ćirić
- ***Weighted Automata over Semirings and Lattices - D/08/02092*** (2009-2010)
  Bilateral German-Serbian project
  Funded by: Deutcher Akademischer Austauchdienst – DAAD, Ministry of Education, Science, and Technological Development, Republic of Serbia
  Participating institutions: University of Novi Sad, University of Niš, University of Leipzig, and Technical University of Dresden
  Project managers: Andreja Tapavčević (Novi Sad), Heiko Vogler (Dresden)
- ***Development of methods of computation and information processing: theory and applications - 174013*** (2011-2019)
  Leader of the subproject ***Automata, Quantum Computing and Fuzzy Systems***
  Funded by: Ministry of Education and Science, Republic of Serbia
  Project holder: Faculty of Sciences and Mathematics, University of Niš
  Project leader: Miroslav Ćirić
- ***Weighted pushdown automata with different acceptance modes*** (2019-2020)
  Aufbau internationaler Kooperationen mit Serbien
  Funders: DFG - German Research Foundation
  Participating institutions: University of Leipzig, Universities of Novi Sad, University of Kragujevac
  Project manager: Manfred Droste (Leipzig)

Project management – Projects Related to Teaching:

- ERASMUS + KA2 CBHE, 598434-EPP-1-2018-1-RS-EPPKA2-CBHE-JP: Strengthening Teaching Competences in Higher Education in Natural and Mathematical – TeComp (2018-2021)

Participation in Projects Related to Teaching:

- TEMPUS, SM_SCM-C024B06-2006 (RS): Network education at Faculties of Science in Serbia – NEFS (2007-2008)
- TEMPUS, 511140-TEMPUS-1-2010-1-RS-TEMPUS-JPCR: Master programme in Applied Statistics (2010-2013)

Membership in Professional Societies:

- EUSFLAT - European Society for Fuzzy Logic and Technology
- IFSA - International Fuzzy Systems Association
- Serbian Mathematical Sciences Association

Refereeing and Reviewing:

- **Refereeing:**
  Fuzzy Sets and Systems, Information Sciences, IEEE Transactions on Fuzzy Systems, International Journal of Uncertainty Fuzziness and Knowledge-based Systems, Facta Universitatis (Niš), Series Mathematics and Informatics, Filomat (Niš), etc.

Editorial Activities:

- **FACTA UNIVERSITATIS** (University of Niš, Faculty of Sciences and Mathematics)
  Area editor for Algebra, Fuzzy Mathematics, Theoretical Computer Science
- **KRAGUJEVAC JOURNAL OF MATHEMATICS** (University of Kragujevac, Faculty of Science)
  Area editor for Algebra

Supervised PhD theses:

1. **Ivana Micić**, Bisimulations for Fuzzy Automata (in English), PhD thesis, University of Niš, Faculty of Sciences and Mathematics, 2014.
2. **Zorana Jančić**, Algorithms for Determinization of Weighted and Fuzzy Automata (in English), PhD thesis, University of Niš, Faculty of Sciences and Mathematics, 2014.
3. **Ivona Brajević,** Improvements of some Population-Based Metaheuristics for Constrained Optimization Problems (in Serbian), PhD thesis, University of Niš, Faculty of Sciences and Mathematics, 2015.

Recognition and Awards:

- **Conference of PhD Students in Computer Science • Szeged • Hungary, 2000**
  Second Best Talk Award

Books

Monographs:

J. Ignjatović, M. Ćirić,
Automata and Formal Languages (Automati i formalni jezici), (in Serbian)
University of Niš, Faculty of Sciences and Mathematics, Niš, 2016

Text Books:

M. Ćirić, J. Ignjatović,
Theory of Algorithms, Automata and Languages – Book of Problems (Teorija algoritama, automata i jezika – Zbirka zadataka), (in Serbian)
University of Niš, Faculty of Sciences and Mathematics, Niš, 2012

Research Publications

	In progress (3)
[40]	M. Ćirić, J. Ignjatović, P.S. Stanimirović, Computation of outer inverses in the full transformaton semigroup of a finite set, to appear.
[39]	J. Ignjatović, M. Ćirić, B. De Baets, General method for solving equations and inequalities defined by residuated functions, to appear.
[38]	M. Ćirić, P.S. Stanimirović, J. Ignjatović, Outer and inner inverses in semigroups belonging to the prescribed Green's equivalence classes, to appear.
	2019 (2)
[37]	[M. Ćirić, J. Ignjatović, I. Stanković, Direct and indirect methods for solving two-mode systems of fuzzy relation equations and inequalities, in: M. E. Cornejo et al. (eds.), Trends in Mathematics and Computational Intelligence, STUDIES IN COMPUTATIONAL INTELLIGENCE Vol. 796, Springer, 2019, pp. 19–38.
[36]	M. Ćirić, J. Ignjatović, The existence of generalized inverses of fuzzy matrices, in: L. T. Kóczy et al. (eds.), Interactions Between Computational Intelligence and Mathematics Part 2, STUDIES IN COMPUTATIONAL INTELLIGENCE Vol. 794, Springer, 2019, pp. 155–165 .
	2018 (3)
[35]	I. Brajević, J. Ignjatović, An upgraded firefly algorithm with feasibility-based rules for constrained engineering optimization problems, JOURNAL OF INTELLIGENT MANUFACTURING (2018) https://doi.org/10.1007/s10845-018-1419-6.
[34]	S. Stanimirović, M. Ćirić, J. Ignjatović, Determinization of fuzzy automata by factorizations of fuzzy states and right invariant fuzzy quasi-orders, INFORMATION SCIENCES (2018) 79–100.
[33]	J. Ignjatović, M. Ćirić, Z. Jančić, Weighted finite automata with output, SOFT COMPUTING 22(4) (2018) 1121-1138.

2017 (2)

[32] I. Stanković, M. Ćirić, J. Ignjatović, Fuzzy relation inequalities and equations with two unknowns and their applications, FUZZY SETS AND SYSTEMS 322 (2017) 86–105.

[31] J. Ignjatović, M. Ćirić, Moore-Penrose equations in involutive residuated semigroups and involutive quantales, FILOMAT 31:2 (2017) 183–196.

2016 (1)

[30] Z. Jančić, I. Micić, J. Ignjatović, M. Ćirić, Further improvements of determinization methods for fuzzy finite automata, FUZZY SETS AND SYSTEMS 301 (2016) 79-102.

2015 (5)

[29] A. Stamenković, M. Ćirić, J. Ignjatović, Different models of automata with fuzzy states, FACTA UNIVERSITATIS (Niš), SERIES MATHEMATICS AND INFORMATICS 30 (3) (2015), 235–253.

[28] M. Ćirić, J. Ignjatović, I. Stanković, Regular fuzzy equivalences on multi-mode multi-relational fuzzy networks, in: Proceedings of the 2015 Conference of the International Fuzzy Systems Association and the European Society for Fuzzy Logic and Technology (IFSA-EUSFLAT 2015), Gijón, Asturias, Spain, Advances in Intelligent Systems Research Vol. 89, 2015, pp. 398-403.

[27] J. Ignjatović, M. Ćirić, I. Stanković, Bisimulations in fuzzy social network analysis, in: Proceedings of the 2015 Conference of the International Fuzzy Systems Association and the European Society for Fuzzy Logic and Technology (IFSA-EUSFLAT 2015), Gijón, Asturias, Spain, Advances in Intelligent Systems Research Vol. 89, 2015, pp. 404-411.

[26] I. Micić, Z. Jančić, J. Ignjatović, M. Ćirić, Determinization of fuzzy automata by means of the degrees of language inclusion, IEEE TRANSACTIONS ON FUZZY SYSTEMS 23 (6) (2015) 2144–2153.

[25] J. Ignjatović, M. Ćirić, B. Šešelja, A. Tapavčević, Fuzzy relation inequalities and equations, fuzzy quasi-orders, and closures and openings of fuzzy sets, FUZZY SETS AND SYSTEMS 260 (2015) 1-24.

2014 (3)

[24] A. Stamenković, M. Ćirić, J. Ignjatović, Reduction of fuzzy automata by means of fuzzy quasi-orders, INFORMATION SCIENCES 275 (2014) 168–198.

[23] N. Damljanović, M. Ćirić, J. Ignjatović, Bisimulations for weighted automata over an additively idempotent semiring, THEORETICAL COMPUTER SCIENCE 534 (2014) 86–100.

[22] M. Ćirić, J. Ignjatović, M. Bašić, I. Jančić, Nondeterministic automata: equivalence, bisimulations, and uniform relations, INFORMATION SCIENCES 261 (2014) 185–218.

2013 (2)

[21] M. Ćirić, J. Ignjatović, Fuzziness in Automata Theory: Why? How?, in: R. Seising, E. Trillas, C. Moraga, S. Termini (eds.), On Fuzziness, A Homage to Lotfi A. Zadeh, STUDIES IN FUZZINESS AND SOFT COMPUTING Vol. 298, Berlin – New York, Springer 2013, pp. 109–116.

[20] J. Ignjatović, M. Ćirić, V. Simović, Fuzzy relation equations and subsystems of fuzzy transition systems, KNOWLEDGE-BASED SYSTEMS 38 (2013) 48–61.

2012 (4)

[19] M. Ćirić, J. Ignjatović, I. Jančić, N. Damljanović, Computation of the greatest simulations and bisimulations between fuzzy automata, FUZZY SETS AND SYSTEMS 208 (2012) 22–42.

[18] J. Ignjatović, M. Ćirić, N. Damljanović, I. Jančić, Weakly linear systems of fuzzy relation inequalities: The heterogeneous case, FUZZY SETS AND SYSTEMS 199 (2012) 64-91.

[17] M. Ćirić, J. Ignjatović, N. Damljanović, M. Bašić, Bisimulations for fuzzy automata, FUZZY SETS AND SYSTEMS 186 (2012) 100-139

[16] J. Ignjatović, M. Ćirić, Weakly linear systems of fuzzy relation inequalities and their applications: A brief survey, FILOMAT 26(2) (2012), 207-241.

2011 (2)

[15] I. Stanković, J. Ignjatović, M. Ćirić, Boolean relation equations in data analysis, in: Proceedings of the 9th IEEE International Symposium on Intelligent Systems and Informatics (SISY 2011), Subotica, Serbia, 2011, pp. 125-130.

[14] Z. Jančić, J. Ignjatović, M. Ćirić, An improved algorithm for determinization of weighted and fuzzy automata, INFORMATION SCIENCES 181 (2011) 1358–1368.

2010 (5)

[13] J. Ignjatović, M. Ćirić, S. Bogdanović, On the greatest solutions to weakly linear systems of fuzzy relation inequalities and equations, FUZZY SETS AND SYSTEMS 161 (2010) 3081-3113.

[12] M. Ćirić, M. Droste, J. Ignjatović, H. Vogler, Determinization of weighted finite automata over strong bimonoids, INFORMATION SCIENCES 180 (2010) 3497-3520.

[11] M. Ćirić, A. Stamenković, J. Ignjatović, T. Petković, Fuzzy relation equations and reduction of fuzzy automata, JOURNAL OF COMPUTER AND SYSTEM SCIENCES 76 (2010), 609-633.

[10] J. Ignjatović, M. Ćirić, S. Bogdanović, T. Petković, Myhill-Nerode type theory for fuzzy languages and automata, FUZZY SETS AND SYSTEMS 161 (2010) 1288-1324.

[9] J. Ignjatović, M. Ćirić, Formal power series and regular operations on fuzzy languages, INFORMATION SCIENCES 180 (2010) 1104–1120.

2009 (3)

[8] M. Ćirić, J. Ignjatović, Ž. Popović, Stojan M. Bogdanović – scientist, teacher, and poet, FACTA UNIVERSITATIS (Niš), SERIES MATHEMATICS AND INFORMATICS 24 (2009) 1-13.

[7] J. Ignjatović, M. Ćirić, S. Bogdanović, Fuzzy homomorphisms of algebras, FUZZY SETS AND SYSTEMS 160 (2009), 2345–2365.

[6] M. Ćirić, J. Ignjatović, S. Bogdanović, Uniform fuzzy relations and fuzzy functions, FUZZY SETS AND SYSTEMS 160 (2009) 1054–1081.

2008 (1)

[5] J. Ignjatović, M. Ćirić, S. Bogdanović, Determinization of fuzzy automata with membership values in complete residuated lattices, INFORMATION SCIENCES 178 (2008), 164–180.

2007 (2)

[4] M. Ćirić, J. Ignjatović, S. Bogdanović, Fuzzy equivalence relations and their equivalence classes, FUZZY SETS AND SYSTEMS 158 (2007), 1295-1313.

[3] M. Ćirić, A. Stamenković, J. Ignjatović, T. Petković, Factorization of fuzzy automata, in: E. Csuhaj-Varjú and Z. Ésik (Eds.): FCT 2007, LECTURE NOTES IN COMPUTER SCIENCE 4639 (2007), 213–225.

2002 (1)	
[2]	J. Kovačević, M. Ćirić, T. Petković, S. Bogdanović, Decompositions of automata and reversible states, PUBLICATIONES MATHEMATICAE DEBRECEN 60 (3-4) (2002), 587-602.
1998 (1)	
[1]	M. Ćirić , S. Bogdanović, J. Kovačević, Direct sum decompositions of quasi-ordered sets and their applications, FILOMAT (Niš) 12:1 (1998), 65-82.