PERSONAL INFORMATION

Name and surname	Marko Topalovic
Date and place of birth	1981 Kragujevac
Scientific title	Research Associate
E-mail	topalovic@kg.ac.rs
Educational-scientific / educational-artistic field	Technical-Technological Sciences
University, Faculty, Organizational unit	Institute for Information Technologies, University of Kragujevac Department of Technical-Technological Sciences
Research field and areas	Mechanical Engineering (Applied Mechanics, Applied Informatics and Computer Engineering)

EDUCATION

BACHELOR

Year	2006
Place	Kragujevac
Institution	Faculty of Mechanical Engineering, University of Kragujevac

MASTER STUDIES

Year	
Place	
Institution	

DOCTORAL DISSERTATION

Year	2016
Place	Kragujevac
Institution	Faculty of Engineering, University of Kragujevac

Title of doctoral dissertation	Numerical modeling of granular materials
Scientific title	PhD
Research area	Applied Mechanics, Applied Informatics and Computer Engineering

PROFESSIONAL BIOGRAPHY – ELECTION IN RESEARCH OR SCIENTIFIC TITLE

Date	Institution	Scientific title
2012	Faculty of Mechanical Engineering, University of Kragujevac	Research Assistant
2015	Faculty of Engineering, University of Kragujevac	Research Assistant
2017	Faculty of Engineering, University of Kragujevac	Research Associate
2022	Institute for Information Technologies, University of Kragujevac	Research Associate

PROFESSIONAL BIOGRAPHY - TRAINING

Year	Institution	Duration

ENGAGEMENT IN THE FORMATION OF SCIENTIFIC PERSONNEL

PARTICIPATION IN NATIONAL PROJECTS FINANCED BY MINISTRY OF EDUCATION/MINISTRY OF SCIENCE AND TECHNOLOGICAL DEVELOPMENT/SCIENCE FUND OF THE REPUBLIC OF SERBIA:

TR32036 "Software development for coupled multiphysics problems" (01.11.2011 – 31.12.2019)

PARTICIPATION IN INTERNATIONAL PROJECTS

Bridge technical differences and social suspicions contributing to transform the Adriatic area in a stable hub for a sustainable technological development ADRIA-HUB 2010-2013.

MEMBERSHIP IN SCIENTIFIC AND PROFESSIONAL ASSOCIATIONS

Serbian Society of Mechanics Serbian Society of Computational Mechanics

ORGANIZATION OF NATIONAL/INTERNATIONAL SCIENTIFIC MEETINGS (CONFERENCES, CONGRESSES...)

IEEE BIBE 2022 The 22nd IEEE International Conference on BioInformatics and BioEngineering **https://bibe2022.asia.edu.tw/program-committee/**

LIST OF SCIENTIFIC PAPERS:

Monographs, Monographic studies, Thematic anthologies	**Sum**
Papers published in scientific journals of international scientific importance	**Sum** 12
1. Tijana Djukić, **Marko Topalović**, Nenad Filipović, Numerical simulation of isolation of cancer cells in a microfluidic chip, Journal of Micromechanics and Microengineering, (2015), Vol.25, pp. 084012 (9pp), ISSN: 0960-1317, DOI: 10. 1088/0960-1317/25/8/084012 2. Aleksandar Nikolic, **Marko Topalovic**, Vladimir Simic, Nenad Filipovic, Turbulent finite element model applied for blood flow calculation in	

arterial bifurcation, Computer Methods and Programs in Biomedicine, (2021), Vol. 209, pp. 106328, DOI:10.1016/j.cmpb.2021.106328

3. **Marko Topalovic**, Aleksandar Nikolic, Vladimir Milovanovic, Snezana Vulovic, Milos Ivanovic, Smoothed particle hydrodynamics for blood flow analysis: development of particle lifecycle algorithm, Computational Particle Mechanics, (2022), DOI:10.1007/s40571-021-00454-6

4. Vladimir Milovanović, Dušan Arsić, Miroslav Milutinović, Miroslav Živković, **Marko Topalović**, A Comparison Study of Fatigue Behavior of S355J2+N, S690QL and X37CrMoV5-1 Steel, Metals, (2022), Vol. 12 No. 7. pp. :1199 , DOI:10.3390/met12071199

5. Tijana Djukic, **Marko Topalovic**, Nenad Filipovic, Validation of lattice Boltzmann based software for blood flow simulations in complex patient-specific arteries against traditional CFD methods, Mathematics and Computers in Simulation, (2023), Vol. 203. pp. 957–976, DOI:10.1016/j.matcom.2022.07.027

6. Ljudmila Kudrjavčeva, Milan Mićunović, **Marko Topalović**, Simon Sedmak, Thermomechanics of soft inelastics bodies with application to asphalt behavior, Thermal Science, (2014), Vol.18, No. Suppl. 1, pp. 221-228, ISSN: 0354-9836, DOI: 10.2298/TSCI130812184K

7. Cristiano Fragassa, **Marko Topalovic**, Ana Pavlovic, Snezana Vulovic, Dealing with the Effect of Air in Fluid Structure Interaction by Coupled SPH-FEM Methods, Materials, (2019), Vol. 12, No. 7, pp. E1162, DOI: 10.3390/ma12071162

8. Radovan Petrović, Miroslav Živković, **Marko Topalović**, Radovan Slavković, Analytical, numerical and experimental stress assessment of the spherical tank with large volume, Tehnicki Vjesnik = Technical Gazette, (2015), Vol.22, No.5, pp. 1135-1140, DOI:10.17559/TV-20130905131504

9. Milan Blagojević, Dragan Rakić, **Marko Topalović**, Miroslav Živković, Optical coordinate measurements in automotive industry, Tehnicki Vjesnik = Technical Gazette, (2016), Vol.23, No.5, pp. 1541-1546, DOI: 10.17559/TV-20130918160442

10. **Marko Topalovic**, Aleksandar Nikolic, Snezana Vulovic, Vladimir Milovanovic, FSI Analysis with Continuous Fluid Flow Using FEM and SPH Methods in LS-DYNA, Journal of the Serbian Society for Computational Mechanics, (2021), Vol. 15, No. 2, pp. 93-100 DOI: 10.24874/jsscm.2021.15.02.09

11. Aleksandar Nikolic, **Marko Topalovic**, Vladimir Simic, Milan Blagojevic, Blood Flow in Arterial Bifurcation Calculated by Turbulent Finite Element Model, Journal of the Serbian Society for Computational Mechanics, (2021), Vol. 15, No. 2, pp. 79-92, DOI: 10.24874/jsscm.2021.15.02.08

12. Dragoljub Stevanović, **Marko Topalović**, Miroslav Živković, Improvement of the Sparse Matrices Storage Routines for Large FEM Calculations, Journal of the Serbian Society for Computational Mechanics, (2021), Vol. 15, No. 1, pp. 81-97, DOI: 10.24874/jsscm.2021.15.01.06

Proceedings of international scientific conferences	**Sum** 36

1. Miroslav Živković, **Marko Topalović**, Radovan Slavković, Vladimir Dunić, Abaqus subroutine development and implementation for Neo-Hook hyperelastic material model, The 3rd International Conference of Serbian Society of Mechanics (IConSSM 2011), Vlasinsko Jezero, (2011), 5-8 Jul, pp. 889-896, ISBN 978-86-909973-3-6

2. **Marko Topalović**, Miroslav Živković, Nenad Busarac, Snežana Vulović, Improvement and integration of FEM solution used for R&D into FEMAP, Conference on Mechanical Engineering Technologies and Applications - COMETa 2012, Jahorina, Bosna i Hercegovina, (2012), 28-30 November, pp. 255-262, ISBN 978-99938-655-4-4

3. Milan Blagojević, Miroslav Živković, **Marko Topalović**, Registration and surface inspection of automotive pressed parts based on point cloud generated by optical measuring techniques, International Congress Motor Vehicles & Motors 2012 - MVM2012, Kragujevac, (2012), 3-5 Oktober, pp. 334-339, ISBN 978-86-86663-91-7

4. Miroslav Živković, Miloš Janošević, Snežana Vulović, Nenad Busarac, **Marko Topalović**, Thermal analysis of high power reduction gearbox, Conference on Mechanical Engineering Technologies and Applications -

COMETa 2012, Jahorina, Bosna i Hercegovina, (2012), 28-30 November, pp. 355-358, ISBN 978-99938-655-4-4

5. Dragan Adamović, Milentije Stefanović, Srbislav Aleksandrović, Miroslav Živković, Fatima Živić, **Marko Topalović**, Analysis of tribological process during ironing of sheet metal made of AlMg3, SERBIATRIB '13, 13th International Conference on Tribology, Kragujevac, (2013), 15–17 May, pp. 265-269, ISBN 978-86-86663-98-6

6. **Marko Topalović**, Miloš Ivanović, Miroslav Živković, Aleksandar Dišić, Comparison of FEM and SPH methods used for analysis of solid bodies, IConSSM 2013 - The 4rth International Congress of Serbian Society of Mechanics, Vrnjacka Banja, (2013), 4-7 June, pp. 401-406, ISBN 978-86-909973-5-0

7. Milan Micunović, Ljudmila Kudrjavceva, **Marko Topalović**, Thermomechanics of soft inelastics bodies - an application to asphalt behavior, IConSSM 2013 - The 4rth International Congress of Serbian Society of Mechanics, Vrnjacka Banja, (2013), 4-7 June, pp. 371-375, ISBN 978-86-909973-5-0

8. **Marko Topalović**, Vladimir Milovanović, Milan Blagojević, Aleksandar Dišić, Dragan Rakić, Miroslav Živković, Freight wagon mass reduction using parametric optimisation, VIII International Conference „Heavy Machinery-HM 2014", Zlatibor, (2014), 25-28 June, pp. E.53-60, ISBN 978-86-82631-74-3

9. Milan Blagojević, **Marko Topalović**, Miroslav Živković, Improvement of end-user experience by development of pre- and post-processing solution for FEM magnetostatic solver PAK-M, 8th International Quality Conference, Kragujevac, (2014), 23 May, pp. 409-416, ISBN 978-86-6335-004-5

10. Miroslav Živković, **Marko Topalović**, Milan Blagojević, Aleksandar Nikolić, Vladimir Milovanovć, Siniša Mesarović, Jagan Padbidri, Boundary identification and weak periodic condition application in DEM method, 2nd International Scientific Conference COMETa, East Sarajevo - Jahorina, Bosnia & Herzegovina, (2014), 2-5 December, pp. 365-370, ISBN 978-99976-623-1-6

11. Radovan Petrović, Jelena Živković, **Marko Topalović**, Miroslav Živković, Gordana Jovičić, Analytical stress calculation in spherical tank and experimental verification, XIIIth Youth Symposium on Experimental Solid Mechanics, Dečin, Czech Republic, (2014), 29 June - 2 July, pp. 92-95, ISBN 978-80-01-05556-4

12. **Marko Topalović**, Milan Blagojević, Aleksandar Nikolić, Miroslav Živković, Nenad Filipović, Application of Smoothed particle hydrodynamics in biomechanics: advanced procedure for discretization of complex biological shapes into pseudo-particles, 15th International Conference on Bioinformatics & Bioengineering (BIBE 2015), Beograd, (2015), 2-4 November, pp. 142 (4pp), ISBN 978-1-4673-7982-3
13. **Marko Topalović**, Modelling granular materials with meshless DEM and SPH methods, Fifth Serbian (30th YU) Congress on Theoretical and Applied Mechanics, Arandjelovac, (2015), 15-17 June, pp. C-13 (6pp), ISBN 978-86-7892-715-7
14. Milan Micunović, Ljudminla Kudrjavceva, **Marko Topalović**, Inelasticity of metals - an application to thermal ratchetting, Fifth Serbian (30th YU) Congress on Theoretical and Applied Mechanics, Arandjelovac, (2015), 15-17 June, pp. C-19 (6pp), ISBN 978-86-7892-715-7
15. Nikola Jovanović, **Marko Topalović**, Vladimir Milovanović, Snežana Vulović, Miroslav Živković, Topology optimization used to reduce weight of four-axle bogie freight wagon, 7th International Scientific and Expert Conference of the International TEAM, Beograd, (2015), 15-16 Oktober, pp. 489-492, ISBN 978–86-7083–877–2
16. **Marko Topalović**, Vladimir Milovanović, Aleksandar Dišić, Ana Pavlović, Miroslav Živković, Numerical simulations for addressing flaws in the freight wagon design, achieving goal of increased exploitation functionality, International Congress Motor Vehicles & Motors 2016, Kragujevac, (2016), 6-8 Oktober, pp. 241-246, ISBN 978-86-6335-037-3
17. Dragan Adamović, Miroslav Živković, Tomislav Vujinović, Fatima Živić, **Marko Topalović**, Marko Pantić, Wear of the Tools for the Ironing Process and Methods for Increasing Their Lifetime, 15th International Conference on Tribology, Serbiatrib '17, Kragujevac, (2017), 17-19 May, pp. 408-416.
18. Aleksandar Nikolić, Nenad Filipović, **Marko Topalović**, Miroslav Živković, Finite Element Simulation of Turbulent Flow Using k omega Model and Rans Equations, 4th South-East European Conference on Computational Mechanics, Kragujevac, (2017), 3-5 July, pp. 1-10, ISBN 978-86-921243-0-3
19. Ljudmila Kudrjavceva, **Marko Topalovic**, Milan Micunovic, Rutting Problem for Rubber Wheel Motion over HMA Asphalt Concrete Pavement, 6th International Congress of Serbian Society of Mechanics, Tara, (2017), 19-21 June

20. **Marko Topalović**, Ljudmila Kudrjavceva, Milan Micunović, Temperature Dependent Elasto-Viscoplastic Material Model for Asphalt, 7th International Congress of Serbian Society of Mechanics, Sremski Karlovci, (2019), 24-26 June
21. **Marko Topalović**, Snežana Vulović, Miroslav Živković, Milan Bojović, Combination of Bash and Python in Development of Wrappers used for Automation of Finite Element Analysis, 10th International Conference on Information Society and Technology ICIST 2020, Kopaonik, (2020), 8-11 March
22. Snežana Vulović, Milan Bojović, **Marko Topalović**, Automation of FEM Analysis Report Generation using Visual Basic FEMAP API, 10th International Conference on Information Society and Technology ICIST 2020, Kopaonik, (2020), 8-11 March
23. Vladimir Milovanović, Milan Bojović, **Marko Topalović**, Miroslav Živković, Snežana Vulović, Developing Advanced Subsystem for Securing Steel Coil Cargo on Shimmns Wagon Cradles, XIX International Scientific-Expert Conference on Railways - RAILCON 2020, Niš, Serbia, (2020), 15-16 October, pp. 93-96, ISBN 978-86-6055-134-6
24. Vladimir Milovanović, Nikola Jovanović, Miroslav Živković, Aleksandar Dišić, **Marko Topalović**, Optimization of the Saddle Support Structure of the Freight Wagon Type Shimmns, XIX International Scientific-Expert Conference on Railways - RAILCON 2020, Niš, Serbia, (2020), 15-16 October, pp. 109-112, ISBN 978-86-6055-134-6
25. **Marko Topalović**, Vladimir Milovanović, Nikola Jović, Ljudmila Kudrjavceva, Milan Mićunović, FEM Modelling of Interaction Between Wheel and Asphalt, 5th International Scientific Conference COMETa 2020 "Conference on Mechanical Engineering Technologies and Applications", East Sarajevo, Bosnia and Herzegovina, (2020), 26-28 November, pp. 173-180, ISBN 978-99976-719-8-1
26. Snežana Vulović, Rodoljub Vujanac, Miroslav Živković, **Marko Topalović**, Aleksandar Dišić, FEM Modelling of Wind Load on Industrial Filter, 5th International Scientific Conference COMETa 2020 "Conference on Mechanical Engineering Technologies and Applications", East Sarajevo, Bosnia and Herzegovina, (2020), 26-28. November, pp. 138-145, ISBN 978-99976-719-8-1
27. Snežana Vulović, Danijela Pavlović, Miroslav Živković, Rodoljub Vujanac, **Marko Topalović**, Analysis of Freight Wagons for Transporting of Bulk Materials, The 8th International Congress of the Serbian Society of

Mechanics, Kragujevac, Serbia, (2021), 28-30 June, pp. 1-10, ISBN 978-86-909973-8-1

28. **Marko Topalović**, Aleksandar Nikolić, Snežana Vulović, Vladimir Milovanović, FSI Analysis of Hydrofoils Using FEM and SPH Methods, The 8th International Congress of the Serbian Society of Mechanics, Kragujevac, Serbia, (2021), 28-30 June, pp. 109-114, ISBN 978-86-909973-8-1
29. Miroslav Živković, Vladimir Milovanović, Aleksandar Dišić, Gordana Jovičić, **Marko Topalović**, A Comparative Analysis of Fatigue Behavior Between S355j2+N and STRENX 700 Steel Grade, The 8th International Congress of the Serbian Society of Mechanics, Kragujevac, Serbia, (2021), 28-30 June, pp. 188-193, ISBN 978-86-909973-8-1
30. Aleksandar Nikolić, **Marko Topalović**, Vladimir Simić, Milan Blagojević, Blood Flow in Arterial Bifurcation Calculated by Turbulent Finite Element Model, The 8th International Congress of the Serbian Society of Mechanics, Kragujevac, Serbia, (2021), 28-30 June, pp. 265-272, ISBN 978-86-909973-8-1
31. Vladimir Milovanović, Miroslav Živković, Snežana Vulović, Aleksandar Dišić, **Marko Topalović**, Experimental and numerical strength analysis of freight wagon type SHIMMNS intended for the transportation of the sheet coils, The Tennth International Triennial Conference Heavy Machinery HM 2021, Vrnjačka Banja, Serbia, (2021), 23–25 June, pp. E.45-E.52, ISBN 978-86-81412-09-1
32. Aleksandar Nikolić, **Marko Topalović**, Milan Blagojević, Vladimir Simić, Blood Flow in Coronary Artery Bifurcation Calculated by Turbulent Finite Element Model, 1st International Conference on Chemo and Bioinformatics, Kragujevac, Serbia, (2021), 26-27 October, pp. 235-238, DOI:10.46793/ICCBI21.235N
33. **Marko Topalović**, Aleksandar Nikolić, Miroslav Zivković, Blood Flow Simulation Using SPH Method in Ls-Dyna, Analysis of Advantages and Disadvantages, 1st International Conference on Chemo and Bioinformatics, Kragujevac, Serbia, (2021), 26-27 October, pp. 255-258, DOI:10.46793/ICCBI21.255T
34. Aleksandar Nikolić, **Marko Topalović**, Vladimir Simić, Nenad Filipović, Calculation of blood flow in carotid artery bifurcation by turbulent finite element method, The 21st IEEE International Conference on BioInformatics and BioEngineering, Kragujevac, Serbia, (2021), 26-27 October, paper_80 1:4, DOI:10.46793/ICCBI21.235N

35. Snežana Vulović, Miroslav Živković, Rodoljub Vujanac, Ana Pavlović, **Marko Topalović**, Determining the Numerical Values of the Potential at the Measuring Points, 6th International Scientific Conference COMETa 2022 "Conference on Mechanical Engineering Technologies and Applications", East Sarajevo, Bosnia and Herzegovina, (2022), 17-19. November, pp. 465-470, ISBN 978-99976-947-6-8

36. Snežana Vulović, Miroslav Živković, Rodoljub Vujanac, Ana Pavlović, **Marko Topalović**, FEM Analysis of Continuous Tracks, 1st International Conference on Mathematical Modelling in Mechanics and Engineering, Belgrade, Serbia, (2022) 8-10 September, pp. 114, ISBN 978-86-6060-127-0

Proceedings of national scientific conferences	**Sum**
	1

Marko Topalović, Milan Blagojević, Miroslav Živković, Povezivanje programa za SPH proračune sa programom za postprocesiranje ParaView, XVIII konferencija YU INFO 2012, Kopaonik, (2012), 29 Februar- 3 March, pp. 260-263, ISBN 978-86-85525-09-4

Monographs of national importance	**Sum**

Scientific papers in national journals	**Sum**
	7

1. Dragan Adamović, Vesna Mandić, Miroslav Živković, Zvonko Gulisija, Milentije Stefanović, **Marko Topalović**, Srbislav Aleksandrović, Numerical modeling of ironing process, Journal for Technology of Plasticity, (2013),Vol.38, No.2, pp. 109-124, ISSN 0354-3870

2. Milan Blagojević, Miroslav Živković, **Marko Topalović**, Registration and Surface Inspection of Automotive Pressed Parts Based on Point Cloud Generated by Optical Measuring Techniques, Mobility and Vehicle Mechanics, (2017), Vol. 43, No. 4, pp. 1-11. ISSN 1450 – 5304

3. **Marko Topalović**, Vladimir Milovanović, Nikola Jović, Ljudmila Kudrjavceva, Milan Mićunović, FEM Modelling of Interaction Between Wheel and Asphalt, Machine Design, (2020), Vol. 12, No. 4, pp. 89-94, ISSN 1821-1259

4. Đukić Tijana, **Topalović Marko**, Filipović Nenad, Parallelization of specialized fluid flow simulator based on lattice boltzmann method on a

multi GPU system, IPSI BgD Transactions on Advanced Research (TAR), (2014), Vol.10, No.1, pp. 8-12, ISSN 1820-4511, (M53)

5. **Marko Topalović**, Đorđe Damnjanović, Aleksandar Peulić, Milan Blagojević, Nenad Filipović, Syllable-based speech recognition using electromyography and decision set classifier, Biomedical Engineering: Applications, Basis and Communications, (2014) Vol. 27, No. 2, pp. 1550020 (9pp), DOI: 10.4015/S101623721550020

6. Dragan Adamović, Tomislav Vujinović, Fatima Živić, Jelena Živković, **Marko Topalović**, Application of Aluminum and ITS Alloys in the Automtiove Industry with Special Emphasis PN Wheel Rims, Traffic and Transport Theory and Practce, Journal for Traffic and Transport Research and Application, (2021), Vol. 6, No. 7, pp. 87-95, DOI: 10.7251/JTTTP2102087A

7. Snežana Vulović, Rodoljub Vujanac, Miroslav Živković, **Marko Topalović**, Aleksandar Dišić, FEM Modelling Of Wind Load On Industrial Filter, IETI Transactions on Engineering Research and Practice, (2021), Vol. 5, No. 1, pp. 24-33, DOI:10.6723/TERP.202102_5(1).0004

Technical solutions	**Sum**
	2

1. Miroslav Živković, Radovan Slavković, Milan Blagojević, **Marko Topalović**, Nenad Busarac, Jelena Borota, Softver za numeričko rešavanje elektrostatičkih problema PAK-E, TR-69/2012, Univerzitet u Kragujevcu, Fakultet inženjerskih nauka, Kragujevac, 2012

2. Miroslav Živković, Radovan Slavković, Miloš Kojić, Nenad Grujović, Snežana Vulović, Nenad Busarac, **Marko Topalović**, Softver za proračun temperaturnog polja konstrukcija PAK-T, TR-68/2012, Univerzitet u Kragujevcu, Fakultet inženjerskih nauka, Kragujevac, 2012

Patents	**Sum**

CITATION OF SCIENTIFIC PAPERS

A total of 36 citations without self-citations (according to Scopus), of which 8 in 2022.

BRIEF DESCRIPTION OF RESEARCH IN THE PREVIOUS PERIOD

Modification of FEM (Finite Element Method) program PAK-S using dynamic memory allocation.
Embedding a method for packing a stiffness matrix into memory using a red-black tree.
Development and improvement of the parallelization of the PAK-S program using the MUMPS solver for solving sparse matrices using the MPICH implementation of the MPI standard.
Adaptation and development of the SPH (Smoothed Particle Hydrodynamics) program. Solving the problem of generating and deleting SPH particles using the so-called "life cycle algorithm". Using this algorithm, blood flow through arteries was modeled.

BRIEF DESCRIPTION OF PLANNED RESEARCH IN THE NEXT PERIOD

Application of the SPH method in bioengineering. Modeling of blood flow in the heart using the SPH program.
Adaptation of the LINUX project for compiling the FEM solver PAK-S.