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Research Interests

- Operational research
- Computational intelligence
- Machine learning
- Big data
- Metaheuristics
- Evolutionary algorithms
- Bioinformatics
- Graph theory

Professional Experience

- **Full Professor (**December 2019 – present), Computer Science Department, Faculty of Mathematics, University of Belgrade, Serbia, (http://www.math.rs)
  - Teaches graduate Computer Science courses: Software Engineering – Advanced Concepts (Agile methodologies, DDD, SOA, Microservices), Genetic Algorithms, Soft Computing
  - Teaches undergraduate Computer Science courses: Software Engineering (C#), Object - Oriented programming (Java), Introduction to Web and Internet Technologies (JavaScript)
- **Associate Professor (**May 2013 – December 2019), Computer Science Department, Faculty of Mathematics, University of Belgrade, Serbia, (http://www.math.rs)
  - Teaches graduate Computer Science courses: Genetic Algorithms, Soft Computing, Methodology of professional and scientific work and Software Development – Advanced Concepts
  - Teaches undergraduate Computer Science courses: Software Development (C#), Object - Oriented programming (Java), Microprocessors and their Usage in Education (Assembler)
  - Manager of the project "Developing new study program in English language for PhD studies in Informatics", supported and funded by Serbian Ministry of Education, Science and Technology, within program activity 0014 "High Education Development" in program 2005 “High Education"
- **Associate Professor – Adjunct (**Oct 2013 – January 2020), Faculty of Natural Science and Mathematics, Banja Luka University, Republic of Srpska, Bosnia and Hercegovina (http://unibl.org/en/members/faculties/faculty-of-natural-sciences-and-mathematics)
  - Teaches undergraduate Computer Science courses: Methodology of Computer Science Teaching (HTML, Moodle), Multimedia in Education (HTML, JavaScript, TreeJS), Object - Oriented programming (Java), Internet Programming (SQL, PHP), Computers and their Usage in Biology (R, Bioclipse)
- **Visiting Fellow (**Feb 2018 – Oct 2018) Department for Computer Science, Systems and Communications, University Milano-Bicocca, Milano, Italy, (http://www.disco.unimib.it/)
  - In joint work with colleagues from AlgoLab research group, developed novel metaheuristics for some important problems in Bioinformatics, such as cancer evolution interference, alternative splicing prediction and haplotype assembly. Metaheuristics are based on Genetic Algorithms and implemented in Python
- **Head of Computer Science Department (**Feb 2017 – Oct 2017), Faculty of Mathematics, University of Belgrade, Serbia, (http://www.racunarstvo.matf.bg.ac.rs/?content=okatedri)
- **Chief Technology Office** (Jan 2008 – Sep 2015) Marketing Business System, Belgrade, Serbia

- Managed design and development of the Informational system "eMunicipality" , that fully supports work of municipality administration, all officers "end - to - end", including registration office , assignment and resolving of the files , appeal procedure, advanced reports , local taxes, investment and estate, tender procedures, human resources, web portal and other services. Informational system is developed together with MBS company engineers, it is implemented and it works in city Bar, Montenegro.
- System is presented at XV Scientific Conference Informational Technologies – Today and Tomorrow IT 2010.
- In December 2010, Union of Municipalities of Montenegro awards this system as Best Practice in the area of the “Introduction of the IT in Service Provision Process".
- Designed and implemented informational system "Polyclinic". System is based on Service-oriented architecture, it has web interface, uses .NET 4.0 technologies and Microsoft SQL Server DBMS for storing data. Informational system is deployed at polyclinic VannaCare, Belgrade

- **Head of Software Testing and Certification Laboratory** (Jan 2007 – Jun 2016), Faculty of Mathematics, University of Belgrade, Serbia
  - Development and implementation of embedded software testing in various devices like watt meters, weighing instruments and gaming machines
  - Organized and realized Software Testing of Embedded Systems (watt meters, weighing instruments, etc.); Gaming Machines Testing throughout Serbia
  - Designed and developed informational system "DMPM", for Directorate of Measures and Precious Metals. Informational system fully supports work of Sector for Development of Metrology in Directorate of Measures and Precious Metals. Informational system "DMPM" is a web application, developed with Microsoft .NET technology and with programming language C#. Microsoft SQL Server is used as RDBMS and Microsoft SQL Reporting is used for reporting
  - Member of Commission for Software and Commission for Application of Regulation in Gambling Industry within Directorate for Measurements and Precious Metals (Serbia)
- **Vice Dean for Academic Affairs** (Jan 2008 – Dec 2011), Faculty of Mathematics, University of Belgrade, Serbia
- **Assistant Professor (**Sep 2006 – May 2013), Computer Science Department, Faculty of Mathematics, University of Belgrade, Serbia
  - Taught graduate Computer Science courses: Genetic Algorithms, Soft Computing, Methodology of professional and scientific work and Software Development – Advanced Concepts
  - Taught undergraduate Computer Science courses: Software Development (C#), Object - Oriented programming (Java), Microprocessors and their Usage in Education (Assembler)
  - Envisioned, designed and realized project of data digitalization for the Bar County Museum, where digital assets are kept, catalogued and managed by web-based open-source solution
  - Project for Human Resource Informational System within project "eSerbia". Project "eSerbia", developed in 2008, deals with modern on-line public services that (beside e-learning, e-medicine, e-business) include e-government. Basic principles for this project are: data are registered at the place of its origin; accuracy, quality and protection of the data during its transfer and processing; data accessibility to authenticated users under the same conditions; application of uniform standards; standardized exchange of digital data and digital documents.
  - Designed and implemented web presentation of the Public Utility Company “Toplana”, Kraljevo, Serbia.
- **Teaching and Research Assistant** (Sep 1993 – Sep 2006), Computer Science Department, Faculty of Mathematics, University of Belgrade, Serbia
  - Taught several Computer Science courses: Bases of Programming (PASCAL, C), Programming Languages (Java, PROLOG, LISP), Microprocessors and their Usage in Education (Assembler for Intel processors)
- **Senior Web Programmer** (Feb 2000 - July 2001)**,** AnalytX, Inc, Alexandria, Virginia, USA
  - Lead a team of programmers on the design and development of Web-based financial management software, using XML/XSL paradigm
  - Created and integrated a number of Web services deploying .NET architecture
  - Reengineered and normalized legacy databases
  - Supported clients from Fortune 500 companies

- **Senior Programmer** (Jan 1998–Feb 2000), TRAX Corporation, Luxembourg, (http://www.trax.lu)
  - Lead a team of programmers on the conversion of the existing stand-alone Access application to client-server application in Visual Basic, with MS SQL Server and Oracle back-end
  - Ported Visual Basic based financial application from Access to Oracle database
  - Modeled and deployed new business requirements and reengineered existing applications upon those new requirements
  - Created, profiled and tuned complex queries, views, stored procedures and triggers in MS SQL Server, Oracle and Sybase SQL Anywhere
  - Supported many clients, among them are: BGL Luxembourg, BNP-Paris Bas Luxembourg, Credit Agricole …

Education

PhD in Computer Science (June 2006)

Faculty of Mathematics, University of Belgrade, Serbia

Dissertation: "Selection and Migration Operators and Web Services in Evolutionary Applications".

MS in Computer Science (January 1998)

Faculty of Mathematics, University of Belgrade, Serbia

Dissertation: "Proposition for Improvement Tournament Selection Operator in Genetic Algorithms".

GPA: 10.00 / 10.00

BS in Computer Science (May 1993)

Faculty of Mathematics, University of Belgrade, Serbia

Dissertation: "Iterative Algorithms for Solving Linear Equation System on Transputer Computers".

GPA: 9.71 / 10.00

Secondary school diploma (June 1986)

Secondary school, Podgorica, Montenegro

GPA: 5.00 / 5.00

Scholarship and awards

- eMunicipality of Bar - Best practice for introducing information technologies in public services, Montenegro, 2010, (http://www.uom.co.me/en/?p=647)
- Best Paper Award - Online World Conference on Soft Computing WSC 2008: "Two Hybrid Genetic Algorithms for Solving the Super-Peer Selection Problem" by Kratica Jozef, Kojić Jelena, Tošić Dušan, Filipović Vladimir, Dugošija Đorđe
- Best Paper Award - Student Computer Science Conference SINFON 94: "Realization of the Iterative Method on Transputer System" by Filipović Vladimir
- Best student of the class '93, Faculty of Mathematics, University of Belgrade
- 1989-1993 Scholarship awarded by the Government of Serbia to 100 best students of all Serbian universities.
- 1988 Scholarship awarded by the University of Belgrade to 40 best students of the University.
- Best student of the class '86 - Secondary high school, Podgorica

Research activities

- More than 250 citations, over 80 of them from SCI list journals
- Selected papers:
  - Filipović Vladimir: Proposition for Improvement Tournament Selection Operator in Genetic Algorithms, MSc paper (in Serbian), Faculty of Mathematics, Belgrade University, January 1998.
  - Kratica Jozef, Tošić Dušan, Filipović Vladimir, Ljubić Ivana: Solving the Simple Plant Location Problem by Genetic Algorithms, RAIRO - Operations Research, Vol. 35, No. 1, pp. 127-142, 2001.

- Kratica Jozef, Tošić Dušan, Filipović Vladimir, Ljubić Ivana: A Genetic Algorithm for the Uncapacitated Network Design Problem, Soft Computing in Industry - Recent Applications, pp.329-338, Springer Verlag, 2002.
- Filipović Vladimir: Fine-grained Tournament Selection Operator in Genetic Algorithms, Computing and Informatics, Vol.22, No. 2, pp.143-162, 2003.
- Kratica Jozef, Stanimirović Zorica, Tošić Dušan, Filipović Vladimir: Genetic Algorithm for Solving Uncapacitated Multiple Allocation Hub Location Problem, Computing and Informatics – CAI, Vol.24 No 4, pp. 415-426, 2005
- Kratica Jozef, Stanimirović Zorica, Tošić Dušan, Filipović Vladimir: Two Genetic Algorithms for Solving the Uncapacitated Single Allocation p-Hub Median Problem, European Journal of Operational Research – EJOR, 182, pp. 15-28, 2006.
- Filipović Vladimir: Selection and Migration Operators and Web Services in Parallel Evolutionary Algorithms, PhD dissertation (in Serbian), Faculty of Mathematics, Belgrade University, jun 2006.
- Đurić Brankica, Kratica Jozef, Tošić Dušan, Filipović Vladimir: Solving the Maximally Balanced Connected Partition Problem in Graphs by Using Genetic Algorithm, Computing and Informatics Vol. 27 No 3, pp. 341-354, 2008.
- Stanimirović Zorica, Kratica Jozef, Filipović Vladimir, Tošić Dušan: Evolutionary approach for Solving Hab Location Problems, monography (in Serbian), Zavod za udžbenike, Belgrade, 2011.
- Kratica Jozef, Kostić Tijana, Tošić Dušan, Filipović Vladimir, Dugošija Đorđe: A genetic algorithm for the routing and carrier selection problem, Computer Science and Information Systems – COMSIS, Vol. 9 No 1, pp. 49-62, 2012.
- Lazović Bojana, Marić Miroslav, Filipović Vladimir, Savić Aleksandar: An Integer Linear Programming Formulation and Genetic Algorithm for the Maximum Set Splitting Problem, Publications de l'Institut Mathématique, Nouvelle série, tome 92(106), pp. 25–34, 2012.
- Savić Aleksandar, Kratica Jozef, Filipović Vladimir: A New Nonlinear Model for the Two-Dimensional Rectangle Packing Problem, Publications de l'Institut Mathématique, Nouvelle série, tome 93(107), pp. 95–107, 2013.
- Filipović Vladimir, Kartelj Aleksandar, Matić Dragan: An electromagnetism metaheuristic for solving the Maximum Betweenness Problem, Applied Soft Computing, Applied Soft Computing, Vol. 13 No 2, pp. 1303–1313, 2013.
- Kartelj Aleksandar, Mitić Nenad, Filipović Vladimir, Tošić Dušan: Electromagnetism-like algorithm for support vector machine parameter tuning, Soft Computing, Vol. 18, Iss. 10, pp. 1985-1998, 2013.
- Dražić Zorica, Savić Aleksandar, Filipović Vladimir: An integer linear formulation for the file transfer scheduling problem, TOP, Vol. 22, Iss. 3, pp. 1062-1073, 2014.
- Matić Dragan, Kratica Jozef and Filipović Vladimir: Variable Neighborhood Search for solving Bandwidth Coloring Problem, Computer Science and Information Systems, Vol. 14, Iss. 2, pp. 309-327, 2017.
- Grbić Milana, Kartelj Aleksandar, Janković Savka, Matić Dragan and Filipović Vladimir, Variable neighborhood search for partitioning sparse biological networks into the maximum edge-weighted k-plexes, IEEE/ACM Transactions on Computational Biology and Bioinformatics, DOI 10.1109/TCBB.2019.2898189, 2019.
- Filipović Vladimir, Kartelj Aleksandar and Kratica Jozef Edge metric dimension of some generalized Petersen graphs, Results in Mathematics 74: 182, 2019.

- Member of editorial board of following journals:
  - Computer Science and Information Systems - COMSIS
  - Statistics, Optimization & Information Computing - SOIC
  - American Journal of Operational Research - AJOR
  - Mathematical Colloquium - MAT-KOL
- Member of program committee for following conferences:
  - Balkan Conference in Informatics (BCI) - 2012, 2013, 2015

- International Conference on Hybrid Intelligent Systems (HIS) – 2012, 2013, 2014, 2015
- International Conference on Agents and Artificial Intelligence (ICAART) – 2016, 2017, 2019
- International Conference on Green Computing and Internet of Things (ICGCIoT) -2015
- International Conference on Information Society and Technology (ICIST) - 2016
- International Conference on Intelligent Technologies and Applications (INTAP) - 2018
- International Conference on Intelligent Systems Design and Applications (ISDA) – 2012, 2013, 2015
- International Conference of Soft Computing and Pattern Recognition (SoCPaR) -2013
- International Conference on Web Intelligence, Mining and Semantics (WIMS) - 2018
- Conference on Information and Communication Technologies (YUINFO) – 2012, 2014, 2016

- Member of the Project 174010: Mathematical Models and Optimization Methods for Large-Scale Systems, coordinated by Mathematical Institute in Serbia Academy of Science and Art and supported by the Ministry of Science, Technology and Development, Republic of Serbia. The main goal of the research is consideration of real-word large scale systems that needs to be improved using mathematics and optimization methods. Such large scale systems appear in industry, telecommunication, transportation, medicine, electronics, education, chemistry, in public and private sector, etc.
- Member of IEEE Systems, Men and Cybernetics Society - Technical Committee for Soft Computing, IEEE Computational Intelligence Society, IEEE Big Data Community, IEEE Smart Cities Community, IEEE, Serbian mathematical society.
- Leader of the Modelling and optimization group within Faculty of Mathematics, that deals with mathematical modelling and solving of the complex optimization problems, as well as mathematical modeling and improving of the various metaheuristic optimization methods. Optimization problems (from combinatorial and global domain) that are considered have great practical importance and they are used (beside "pure" operational research) in various parts of computer science: machine learning, classification, case-based reasoning, bioinformatics, etc. Problems from various groups that are successfully solved (and still are solving):
  - Location problems – problem is to decide where to locate warehouse or hub in order to achieve that all consumers are supplied and the overall cost is minimal;
  - Transport problems – how to optimally visit all location with given vehicles in order to have minimal expenses;
  - Job scheduling problems – for instance, how to achieve fast file transfer through computer network;
  - Assignment problems – for instance, objective is to assign devices to locations so that the sum of products between flows and distances is minimal or to assign tasks to processor in order to achieve minimal overall costs;
  - Selection problems – for instance, optimally select super-peers in P2P network;
  - Graph partition problems – determining maximally balanced partition in graph; determining maximally connected partition in graph;
  - Graph coloring problems – for instance, coloring graph vertexes (simple and multicolor) in respect to bandwidth;
  - Set partition problems – how to create set partition so family of the subsets of that set have maximal intersection with the created partition;
  - Satisfiability problems – more precisely, problem of probabilistic satisfiability p-SAT;
  - Wireless sensor network problems - more precisely, how to design wireless sensor network in order to achieve minimal energy consumption;
  - Case-based reasoning problems;
  - Classification and data mining problems – classification method adjustment problem; dimensionality reduction problem; cluster analysis problem;
  - Dimensional reduction problems - for instance, feature selection problem;
  - Parameter selection problems - for instance, determination of parameters in kernel learning methods;

- Feature weighting problems - assignment of importance coefficients to features during classification process;
- etc.

Research Projects

- From December 2006, researcher on project 174010: **Mathematical models and opimizational methods for large-scale systems**. Project is coordinated by Mathematical Institute in Serbia Academy of Science and Art. The main goal of our research is consideration of real-word large scale systems that needs to be improved using mathematics and optimization methods. Such large scale systems appear in industry, telecommunication, transportation, medicine, electronics, education, chemistry, in public and private sector, etc. In the process of getting good solution, there are some steps, common for all kind of problems mentioned.
- From December 2017, leader of a project **Developing new study program in English language for PhD studies in Informatics** at Faculty of Mathematics, University of Belgrade. Project is supported and funded by Serbian Ministry of Education, Science and Technology, within program activity 0014 "High Education Development" in program 2005 "High Education".
  This project is the first step in defining new study program in English language for PhD studies in Informatics. It encompasses content innovation and preparation of material required for accreditation and realization of the six PhD courses: Computational Intelligence, Genetic Algorithms, Machine Learning, Bioinformatics, Data Mining in Bioinformatics and Web Mining.
- From 2009 to 2012, took part in Tempus project: 144703-TEMPUS-1-2008-1-BATEMPUS-JPCR SEE **Doctoral Studies in Mathematical Sciences**.
  Project objectivities: to develop structured doctoral studies in mathematical sciences through networking Western Balkans universities in a way that overcomes fragmentation and foster the reciprocal development of human resources in accordance with EHEA-ERA goals; to strengthen master programs in mathematical modelling and financial mathematics; to upgrade laboratories for applied mathematics at consortium members in Western Balkans countries.