

## Dr Milica Petrović



### Personal data

**Address:**

University of Belgrade  
Faculty of Mechanical Engineering,  
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**Nationality:**

Serbian

**Date of birth:**

August 28, 1986

### Research or academic title

Associate Professor

### Research field/area

Intelligent Manufacturing Systems and Processes, Process Planning & Scheduling, Optimization Algorithms, Combinatorial Optimization, Swarm Intelligence, Evolutionary Computation, Artificial Intelligence, Machine Learning, Neural Networks, Robotics, Multi-agent systems, Decision-making methods, Manufacturing technologies.

### Languages

Serbian, English, Russian, Spanish, Polish

## Education

- 2016** | **Doctor of technical sciences (PhD - Mech.Eng.)**  
University of Belgrade - Faculty of Mechanical Engineering,  
Department for Production Engineering  
Dissertation title: Design of intelligent manufacturing systems by using artificial intelligence
- 2010** | **Master of Science – MSc in Mechanical Engineering (four semesters)**  
University of Belgrade – Faculty of Mechanical Engineering,  
Department for Production Engineering  
Thesis title: Towards the development of intelligent manufacturing systems in the domain of indoor material transport based on machine learning
- 2008** | **Bachelor of Science – BSc in Mechanical Engineering (six semesters)**  
University of Belgrade – Faculty of Mechanical Engineering,  
Department for Production Engineering  
Thesis title: Analysis of the possibility of using automatically guided vehicles in the flexible manufacturing system for cans production

## Employment

- Jan. 2011–Present** | **Associate Professor (since September 2021)**  
University of Belgrade – Faculty of Mechanical Engineering,  
Department for Production Engineering  
Laboratory for Industrial Robotics and Artificial Intelligence (ROBOTICS & AI)

## Experience in competitive public calls in previous 5 years

### MISSION4.0

**Project name:** *Deep machine learning and swarm intelligence-based optimization algorithms for control and scheduling of cyber-physical systems in Industry 4.0 – MISSION4.0*, Grant: 6523109 **Relevant Project for MCSecurity**

**Funding source:** Science Fund of the Republic of Serbia

**Implementation period:** 2020-2022.

**Awarded grant amount:** 199,949.18 EUR

**Project PI:** Zoran Miljković

**Role of Milica Petrović:** 2 Work Packages Leader

**Number of citations (excluded self-citations, source: Scopus)**

481

**Hirsch index (excluded self-citations, source: Scopus)**

9

**Other information**

**2019-** External expert assisting to „Research Executive Agency - REA“ (Established by European Commission);

**2019-** Expert of the National Science Centre – Poland for the evaluation of proposals;

**2019-** Expert of the Ministry of Education, Science and Technological Development of the Serbian Government participating in the evaluation of bilateral project proposals;

**2020-** Expert of the Ministry of Education, Science and Technological Development of the Serbian Government participating in the evaluation of Final Examination (Improving the Quality of Education by Introducing Examinations at the End of Secondary Education - IPA 2015);

**2020-** Reviewer of the National Entity for Accreditation and Quality Assurance in Higher Education (NEAQA) participating in the evaluation of study programmes;

**2020-** Expert of the EURAMET (The European Association of National Metrology Institutes) participating in the evaluation of proposals in the EMPIR Calls;

**2022-** The member of the working group of the Institute for the Improvement of Education and Training with the aim of introducing content and outcomes related to artificial

**KEY RESULTS OF MISSION4.0:**

**Journal papers:**

1. Jokić, A., Petrović, M., Miljković, Z., **Semantic Segmentation Based Stereo Visual Servoing of Nonholonomic Mobile Robot in Intelligent Manufacturing Environment**, Journal Expert Systems with Applications, Vol. 190, paper no. 116203, 2022, ISSN: 0957-4174, DOI: 10.1016/j.eswa.2021.116203, <https://www.sciencedirect.com/science/article/abs/pii/S0957417421015189> (Science Citation Index-Web of Science® – IF = 8.665 (2021) → M21a; source KoBSON) **Relevant Publication for MCSecurity**
2. Petrović, M., Ciekowski, M., Romaniuk, S., Wolniakowski, A., Miljković, Z., **A Novel Hybrid NN-ABPE-Based Calibration Method for Improving Accuracy of Lateration Positioning System**, Journal Sensors, Vol. 21 Issue 24, paper no. 8204, 2021, eISSN 1424-8220, DOI: 10.3390/s21248204, <https://www.mdpi.com/1424-8220/21/24/8204> (Science Citation Index-Web of Science® – IF = 3.847 (2021) → M21; source KoBSON) **Relevant Publication for MCSecurity**
3. Petrović, M., Jokić, A., Miljković, Z., Kulesza, Z., **Multi-Objective Scheduling of Single Mobile Robot Based on Grey Wolf Optimization Algorithm**, Applied Soft Computing, Vol. 131, paper no. 109784, 2022, ISSN: 1568-4946, DOI: 10.1016/j.asoc.2022.109784, <https://doi.org/10.1016/j.asoc.2022.109784> (Science Citation Index-Web of Science® – IF = 8.7 (2022) → M21; source KoBSON) **Relevant Publication for MCSecurity**
4. Pawlowski, A., Romaniuk, S., Kulesza, Z., Petrovic, M., **Trajectory optimization using learning from demonstration with meta-heuristic grey wolf algorithm**, IAES International Journal of Robotics and Automation (IJRA), Vol. 11, paper no. 4, pp. 263-277, 2022, ISSN: 2089-4856, DOI: 10.11591/ijra.v11i4.pp263-277, <https://ijra.iaescore.com/index.php/IJRA/article/view/20491>
5. Jokić, A., Đokić, L., Petrović, M., Miljković, Z., **Data Augmentation Methods for Semantic Segmentation-based Mobile Robot Perception System**, Serbian Journal of Electrical Engineering, Vol. 19 No. 3, pp. 291-302, 2022, ISSN: 1451-4869, e-ISSN: 2217-7183, <https://doi.org/10.2298/SJEE2203291J> [http://www.journal.ftn.kg.ac.rs/Vol\\_19-3/](http://www.journal.ftn.kg.ac.rs/Vol_19-3/) (2022) → M52

intelligence into programs of professional educational profiles; University textbook: Miljković, Z., Petrović, M., Intelligent manufacturing systems - with robotics and artificial intelligence backgrounds (university textbook in Serbian), University of Belgrade – Faculty of Mechanical Engineering, XXVIII+409 pages, (I edition), ISBN 978-86-6060-071-6, Belgrade, 2021.

Reviewer in over 40 scientific journals including: IEEE Transactions on Evolutionary Computation; IEEE Transactions on Industrial Electronics; IEEE Transactions on Automation Science and Engineering; CAAI Transactions on Intelligence Technology; Robotics and Computer-Integrated Manufacturing;

#### Conference papers:

6. Đokić, L., Jokić, A., Petrović, M., Miljković, Z., **Biologically Inspired Optimization Methods for Image Registration in Visual Servoing of a Mobile Robot**, Proceedings of the 7<sup>th</sup> International Conference on Electrical, Electronics and Computing Engineering (IcETRAN 2020), pp. (ROI2.2) 715-720 (ISBN 978-86-7466-852-8), Beograd, Serbia, 28-29 September, 2020.
7. Miljković, Z., Petrović, M., **A Survey of Swarm Intelligence-based Optimization Algorithms for Tuning of Cascade Control Systems: Concepts, Models and Applications**, Plenary Session – **Invited paper** (M31), Proceedings of the 5<sup>th</sup> International Conference – Mechanical Engineering in XXI Century (MASING 2020), pp. 3-8 (ISBN 978-86-6055-139-1), Niš, Serbia, 9-10 December, 2020.
8. Jokić, A., Đokić, L., Petrović, M., Miljković, Z., **A Mobile Robot Visual Perception System Based on Deep Learning Approach**, Proceedings of the 8<sup>th</sup> International Conference on Electrical, Electronics and Computing Engineering (IcETRAN 2021), pp. (ROI1.3) 568-572 (ISBN 978-86-7466-894-8), Stanišići, Republic of Bosnia & Herzegovina, 8-10 September, 2021, [https://www.etrans.rs/2021/zbornik/Papers/114\\_ROI\\_1.3.pdf](https://www.etrans.rs/2021/zbornik/Papers/114_ROI_1.3.pdf)
9. Miljković, Z., Đokić, L., Petrović, M., **Object Detection and Tracking in Cooperative Multi-Robot Transportation**, Proceedings of the 38<sup>th</sup> International Conference on Production Engineering, pp. 137-143, Čačak, Serbia, 14-15 October, 2021.
10. Jokić, A., Petrović, M., Miljković, Z., **Mobile Robot Decision-making System Based on Deep Machine Learning**, Proceedings of the 9<sup>th</sup> International Conference on Electrical, Electronics and Computing Engineering (IcETRAN 2022), pp. (ROI1.1) 635-638 (ISBN 978-86-7466-930-3), Novi Pazar, Republic of Serbia, 6-9 June, 2022, [https://www.etrans.rs/2022/zbornik/ICETRAN-22\\_radovi/078-ROI1.1.pdf](https://www.etrans.rs/2022/zbornik/ICETRAN-22_radovi/078-ROI1.1.pdf)
11. Petrović, M., Jokić, A., Miljković, Z., Kulesza, Z., **Multi-Objective Population-based Optimization Algorithms for Scheduling of Manufacturing Entities**, Proceedings of the 26<sup>th</sup> International Conference on Methods and Models in Automation and Robotics (MMAR 2022) ISBN: 978-1-6654-6857-2, pp. 403-407, **IEEE Xplore**: 8 September 2022, (DOI: [10.1109/MMAR55195.2022.9874301](https://doi.org/10.1109/MMAR55195.2022.9874301)), Międzyzdroje, Poland, 22-25 August, 2022, <http://dx.doi.org/10.1109/mmars55195.2022.9874301>

#### Technical solutions:

12. Petrović, M., Jokić, A., Babić, B., **Intelligent Mobile Robot Multi-objective Decision-making System based on Metaheuristic Optimization and Deep Machine Learning** (In Serbian), Technical solution, April 2022 (M85). **Relevant Algorithm for MCSecurity**
13. Jokić, A., Petrović, M., Miljković, Z., Babić, B., **Mobile robot stereo visual perception system based on deep machine learning** (In Serbian), Technical solution, 2021 (M85). **Relevant Algorithm for MCSecurity**
14. Miljković, K., Petrović, M., Babić, B., **Dynamic integrated process planning and scheduling based on genetic algorithms** (In Serbian), Technical solution, 2021 (M85). **Relevant Algorithm for MCSecurity**

#### Datasets:

15. Jokić, A., Petrović, M., Miljković, Z., **Dataset for semantic segmentation of the laboratory model of manufacturing environment** (Version 0.1.0) [Data set]. Zenodo, <http://doi.org/10.5281/zenodo.4138944>, 2020. **Relevant Dataset for MCSecurity**
16. Miljković, K., Petrović, M., **Dataset of alternative process plan networks for dynamic integrated process planning and scheduling** (Version 0.1.0) [Data set]. Zenodo, <http://doi.org/10.5281/zenodo.4400610>, 2020. **Relevant Dataset for MCSecurity**

#### **Additional 2 publications relevant for MCSecurity (3 are listed as key references 1, 2 and 3 of MISSION4.0)**

1. Petrović, M., Miljković, Z., Jokić, A., **Efficient Machine Learning of Mobile Robotic Systems based on Convolutional Neural Networks**, Chapter 1 (M13) – [Efficient Machine Learning of Mobile Robotic Systems Based on Convolutional Neural Networks | SpringerLink](https://link.springer.com/book/9783031287145) printed in the scientific monograph book: *Artificial intelligence for Robotics and Autonomous Systems Applications*, Edited by Prof. Ahmad Taher Azar and Prof. Anis Koubaa (<https://link.springer.com/book/9783031287145>), Series Title: *Studies in Computational Intelligence* (SCI, volume 1093) printed by Springer Cham, Gewerbesraße 11, 6330 – Cham, Switzerland, No. Of chapters: XVI, pages in total: 527, pp. 1-26, ([http://www.lavoisier.eu/books/electricity-electronics/artificial-intelligence-for-robotics-and-autonomous-systems-applications/description\\_4874363](http://www.lavoisier.eu/books/electricity-electronics/artificial-intelligence-for-robotics-and-autonomous-systems-applications/description_4874363)), (Hardcover ISBN

978-3-031-28714-5; eBook ISBN 978-3-031-28715-2),  
First Online: 16th May 2023. **Relevant Publication for  
MCSecurity**

2. Jokic, A., Khazraei, A., Petrovic, M., Jakovljevic, Z., Pajic, M., **Cyber-Attacks on Wheeled Mobile Robotic Systems with Visual Servoing Control**, 2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), *Detroit, MI, USA, 2023*, pp. 6342-6348, doi: 10.1109/IROS55552.2023.10341376. **Relevant Publication for MCSecurity**

#### **Additional 4 projects relevant for MCSecurity**

2020– 2023	Popović, V., Babić, B., Miljković, Z., Jakovljević, Ž., Petrović, M., et al. <i>Integrated research in macro, micro, and nano mechanical engineering – Deep learning of intelligent manufacturing systems in production engineering</i> , Project funded by the Ministry of Education, Science and Technological Development of the Serbian Government, under the contract number 451-03-68/2022-14/200105.
2020– 2021	Petrović, M., <i>Biologically inspired optimization algorithms for control and scheduling of intelligent robotic systems</i> , Grant No. PPN/ULM/2019/1/00354/U/00001, Project funded by The Polish National Agency for Academic Exchange (NAWA).
2011– 2019	Babić, B., Miljković, Z., Petrović, M., et al. <i>An innovative, ecologically based approach to the implementation of intelligent manufacturing systems for the production of sheet metal parts</i> , Grant: TR-35004, Project funded by the Ministry of Education, Science and Technological Development of the Government of the Republic of Serbia.
2017– 2018	Babić, B., Miljković, Z., and Petrović, M., <i>Information technologies in production engineering</i> , Grant: 3119/1, Project within program activity “Development of Higher Education”, Ministry of Education, Science and Technological Development of the Government of the Republic of Serbia.