

Petar B. PETROVIĆ - CURRICULUM VITAE

Biography:

Born on 22. November 1958 in Belgrade, SERBIA; Serbian citizenship; Married, 3 children.

Professional Address:

Department for Production Engineering, Faculty of Mechanical Engineering, University of Belgrade, Kraljice Marije 16, 11120 Belgrade, SERBIA

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Degrees:

1. B.Sc. (1982), Production engineering, Faculty of Mechanical Engineering, University of Belgrade
2. Master of Science in Mechanical Engineering (1989), Production engineering, Faculty of Mechanical Engineering, University of Belgrade, Thesis: "Part-Mating Process in Robotic Assembly".
3. Doctor of Science in Mechanical Engineering (1996), Production engineering, Faculty of Mechanical Engineering, University of Belgrade, Thesis: "Dynamic Modeling and Adaptive Control of Part-Mating Process in Robotic Assembly".

Professional positions:

- 1982 Designer of CNC machine tools and modular manufacturing systems at Machine tool factory Ivo-Lola-Ribar, Belgrade, Serbia
- 1984 Research and Teaching Assistant at the Production Engineering Department, Faculty of Mechanical Eng., University of Belgrade
- 1998 Docent at the Production Engineering Department, Faculty of Mechanical Eng., University of Belgrade
- 2003 Associate Professor at the Production Engineering Department, Faculty of Mech. Eng., University of Belgrade
- 2007 Managing director of the Center for Advanced Manufacturing Technology at Faculty of Mechanical Eng., University of Belgrade
- 2008 Full Professor at the Production Engineering Department, Faculty of Mechanical Eng., University of Belgrade
- 2014 Head of the Cyber-Manufacturing Systems Laboratory, Faculty of Mech. Eng., University of Belgrade

Committee service:

- 2001 Chairman of the Commission for ICT System at Faculty of Mechanical Engineering.
- 2004 Council Member of the Belgrade University Computer Centre (RCUB)
- 2010 Member of the ICT Scientific Committee at Serbian Ministry of Science and Technology Development
- 2010 Member of the Expert Working Group for writing the Serbian Industrial Policy from 2011 to 2020
- 2011 Member of the Steering Committee of the Academic ICT Network of Serbia – AMRES
- 2012 Member of the Expert Working Group for writing the National Policy for the Development of Education in Republic of Serbia by 2020
- 2013 Founder of the Italian-Serbian Collaboration Platform in Advanced Manufacturing – ISCP Initiative for systemic, long-term development of Italian-Serbian science-to-business bilateral relations
- 2017 Advisor to the Minister, Ministry for Innovation and Technological Development, Republic of Serbia
- 2018 Member of the Expert Working Group for writing the National Low for Science and Research of R. of Serbia
- 2021 Advisor to the Minister, Ministry for Innovation and Technological Development, Republic of Serbia

Memberships in professional associations:

- 1982 Member of JUPITER Association for manufacturing technologies
- 1999 Corresponding member of CIRP - International Institution for Production Engineering Research, Paris.
- 2000 Member of IEC (International Electrotechnical Commission), President of national committee 65B – Industrial-Processes Measurement and Control (Devices).
- 2005 Affiliated member of IFAC – International Federation of Automatic Control
- 2007 Corresponding member of the Academy of Engineering Sciences of Serbia – AESS
- 2010 Chair of the Technology Platforms Committee of the Academy of Engineering Sciences of Serbia - AESS
- 2012 Full member of the Academy of Engineering Sciences of Serbia – AESS
- 2014 Euro-CASE Board member as the representative of the Academy of Engineering Sciences of Serbia – AESS; Euro-CASE is the European Council of Academies of Applied Sciences, Technologies and Engineering.
- 2016 Euro-CASE Executive Committee member
- 2022 UNIDO National Expert for Smart Manufacturing

International cooperation:

- 1989 Fraunhofer Institute for Production Engineering - IPA, Stuttgart, Germany.
- 1996 Fuzzy Logic Systems Institute (FLSI) of Kyushu Institute of Technology, Iizuka, Japan

- 1998 Fuzzy Logic Systems Institute (FLSI) of Kyushu Institute of Technology, Iizuka, Japan
- 2002 Fraunhofer Institute of Technology IPT, Aachen, Germany.
- 2002 Laboratory for Machine Tools and Production Engineering, RWTH Aachen, Germany.
- 2003 Brandenburg University of Technology Cottbus, Berlin, Germany.
- 2003 Institute for Machine Tools and Industrial Management, Technische Universität München, Germany.
- 2015 Scuola Superiore Sant'Anna - BioRobotic Institute, Pisa, Italy.
- 2016 Institute for Industrial Technologies and Automation - ITIA CRN, Member of the National Research Council of Italy - CNR, Milan, Italy.
- 2016 Chairman of the IS3 HRC 2016 Italian-Serbian Summer School on Human-Robot Coworking - Master Classes on Human-Robot Coworking and Advanced Robotic Grasping, jointly organized by the University of Belgrade (CyberManufacturing Systems Lab. - CMSysLab) and the BioRobotic Institute of Sant'Anna School of Advanced Studies, Pisa, Italy.
- 2016 Guest professor at Anhui University of Technology, Anhui, China; Lecturing on advanced industrial robotics and cognitive systems in manufacturing.
- 2017 University of Naples – UniNa, Naples, Italy
- 2020 Politecnico di Milano – POLIMI, Milan, Italy
- 2020 Istituto di Sistemi e Tecnologie Industriali Intelligenti per il Manifatturiero Avanzato - STIIMA-CNR, Milan, Italy.
- 2020 Institut polytechnique de Grenoble, Groupe Grenoble INP, Université Grenoble Alpes, Grenoble, France.

Teaching:

Undergraduate studies: Engineering Cybernetics

Graduate studies, master level: Manufacturing Systems Design, Computer Control Systems, Mechatronics Systems, Industrial Assembly Systems, Computer Numerical Control and SCADA Systems

PhD studies: Intelligent Automation, Mechatronics and Adaptronics

Research areas:

Mechanical engineering, Intelligent manufacturing systems and automatic assembly/disassembly, Design theory, Industrial Robotics, Modeling and control of part mating process in robotic assembly, Force and tactile sensing, Machine vision systems, Intelligent signal processing, Pneumatics, Programmable controllers and CNC systems, Soft computing, Fuzzy logic and approximate reasoning, Cybernetics and General systems theory + Cyber-Physical Manufacturing Systems, Virtual and Augmented Reality, Digital Tween, Microcontrollers and Embedded Systems Design, Industrial development and policy making.

Projects:

Project coordinator at over 40 R&D projects funded/financed by government institutions and industry, national, bilateral and international, in the field of production engineering, industrial automation, measurement and control.

Publications:

Over 180 technical publications, more than 80 in international journals and conference proceedings, 2 monograph books, contributor in 4 multi author monograph books published by Springer Verlag Co. and World Scientific Publishing Co.

Selected publications:

1. Milačić, V. R. and Petrović P. B., "Designing Chamfers for Automatic Assembly", *Manufacturing Systems*, Vol.19, No. 2, 1990, pp.: 135-147. (selected paper from 21st CIRP Seminar on Manufacturing Systems, 1989, KTH, Stockholm, SWEDEN;
2. Petrović P. B., Spasić Z., Pešić V., "Flexible automatic system for air filter assembly", *10-th International Conference on Computer-Aided Production Engineering*, Palermo, June 7-9, 1994, ITALY, pp.: 391-398.
3. Petrović P.B., Milačić V., "Fuzzy-Impedance Control and Isotropic Behavior of Manipulating Robots", *The 4th International Conference on Soft Computing IIZUKA'96*, 1996, JAPAN, pp.: 342-345.
4. Petrović P. B., Milačić V., "Adaptive Fuzzy Controller for Robotic Manipulator Designed by Asymptotic Stability Criterion", *The 29th International Symposium on Robotics*, Birmingham, ENGLAND, 27 - 30 April 1998, pp.:379-382.
5. Petrović P. B., Milačić V., "A Fuzzy Dynamic Model and Control of an Artificial Pneumatic Muscle", *The 5th International Conference on Soft Computing IIZUKA'98*, 1998, JAPAN, pp.: 801-804.
6. Petrović P. B., Milačić V., "A Concept of an Intelligent Fuzzy Control for Assembly Robot", 48th CIRP General Assembly, Athens, GREECE, *Annals of the CIRP*, Vol.47/1, 1998, pp.: 9-12.
7. Petrović, P. B., and Milačić, V. R., "Adaptive Fuzzy Control of Mechanical Behavior for a Two Degree-of-Freedom Robotic Manipulator", *Journal of Intelligent Manufacturing*, (1998) Vol. 9, No. 4, Clower Academic Publishers, ISSN 0956-5515, pp.:369-375.
8. Petrović, P. B., and Milačić, V. R., "An Adaptive Fuzzy Network for the Control of Manipulating Robot Dynamic Behavior", *International Journal of Control & Cybernetics*, Special Issue on "Control with Softcomputing", Vol. 27, No. 4, 1998, pp.: 503-519.
9. Petrović P. B., Milačić V., "Closed-form Resolution Scheme of the Direct Kinematics of Parallel Link Systems Based on Redundant Sensory Information", 49th CIRP General Assembly, Montreux, SWITZERLAND, *Annals of the CIRP – Vol.48/1 M8*, 1999, pp.: 341-344.
10. Petrović P. B., Milačić V., "Fuzzy-Impedance Controller for Constrained Robot Motion", pp.: 397-414, Kasabov, Chapter 20 in: Nikola and Kozma, Robert, (Eds) "Neuro-Fuzzy Techniques for Intelligent Information Systems", Springer-Verlag Co. - Phisica-Verlag, Hilderberg New York, 1999, ISBN 3-7908-1187-4.
11. Petrović P. B., Milačić V., "New Linear Feeding System for High Speed Assembly Developed Using Axiomatic Design Theory", *The Third World Congress on Intelligent Manufacturing Processes & Systems*, MIT, Cambridge MA, USA, June 28-30, 2000, pp: 290-295.
12. Petrović P. B., Milačić V., Dželatović G., "New Feeding System for High Speed Assembly Of Small Parts", 50th CIRP General Assembly, Sydney, AUSTRALIA, *Annals of the CIRP*, Vol.49/1, 2000, pp.: 9-12.

13. **Petrović, P. B.**, "Predictive Fuzzy Model for Control of an Artificial Muscle", pp.: 69-92, Chapter 3 in: Cho, Sung-Bae, (Editor) "PRACTICAL APPLICATIONS OF SOFTCOMPUTING IN ENGINEERING", World Scientific Publishing Company, 2001, ISBN 981-02-4523-8.
14. **Petrović P. B.**, " A Fast One-Pass Algorithm for Data-Driven Fuzzy Pattern Recognition", International Journal of Fuzzy Systems, Vol.4, No.2, 2002, pp.: 680-689.
15. **Petrović, P. B.**, Outline of a New Feature Space Deformation Approach in Fuzzy Pattern Recognition, FME Transaction, University of Belgrade, Faculty of Mechanical Engineering, Belgrade, August 2003, pp: 75-87.
16. **Petrović, P. B.**, Lukac, Z., Milacic V.R., Laser-Based System for In-Process Thickness Measurement of Calendered Rubber, Proceedings of MATAR on CD, Praha, 2004.
17. **Petrović, P. B.**, Jakovljević, Z., Intelligent Real-time Cutting Tool Condition Monitoring Based on Discrete Wavelet Transform and Fuzzy Force Pattern Recognition, International IEEE Conference Mechatronics & Robotics, Proceedings, Aachen 2004, Vol. III, pp. 1078-1083.
18. **Petrović, P. B.**, Rubberized Cord Thickness Measurement Based on Laser Triangulation – Part I: Technology, FME Transaction, University of Belgrade, Faculty of Mechanical Engineering, Belgrade, Vol. 35, November 2007, pp: 77-84.
19. **Petrović, P. B.**, Rubberized Cord Thickness Measurement Based on Laser Triangulation – Part II: Validation, FME Transaction, University of Belgrade, Faculty of Mechanical Engineering, Belgrade, Vol. 35, No. 2, November 2007, pp: 85-93.
20. **Petrović, P. B.**, Jakovljević, Z., Dynamic Compensation of Electrical Runout in Eddy Current Contactless Measurements of Non-Stationary Ferromagnetic Target, Sensor letters, Vol.7, 191–202, 2009, doi:10.1166/sl.2009.1031.
21. **Petrović, P. B.**, Jakovljević, Z., Milacic, V., Context sensitive recognition of abrupt changes in cutting process, Expert Systems with Applications 37, 2010, pp: 3721–3729, 10.1016/j.eswa.2009.11.053.
22. **Petrović, P. B.**, Milacic, V., "National Technology Platforms of Serbia", Proceedings, 34th International Conference on Production Engineering, Faculty of Mechanical Engineering, University of Nis, 2011, pp. 15-25, ISBN: 978-86-6055-019-6.
23. Jakovljević, Z., **Petrović, P. B.**, Hodolic, J., Contact states recognition in robotic part mating based on support vector machines, The International Journal of Advanced Manufacturing Technology, 2012, pp: 1-19, DOI 10.1007/s00170-011-3501-5, ISSN 0268-3768.
24. Jakovljević, Z., **Petrović, P. B.**, Mikovic, V., Pajic, M., Fuzzy Inference Mechanism for Recognition of Contact States in Intelligent Robotic Assembly, Journal of Intelligent Manufacturing, 2012, pp: 1-17, DOI 10.1007/s10845-012-0706-x, Print ISSN 0956-5515.
25. Antic, A., **Petrović, P. B.**, Zeljkovic, M., Kosec, B., and Hodolic, J., The Influence of Tool Wear on the Chip-Forming Mechanism and Tool Vibrations, Materials and technology 46 (2012) 3, pp: 279–285, UDK 620.178.1:621.941, ISSN 1580-2949.
26. **Petrović, P. B.**, Lukic, N., and Danilov, I., Compliant Behavior of Redundant Robot Arm -Experiments with Null-Space, Proceedings of 1st International Conference on Electrical, Electronic and Computing Engineering, IcETRAN 2014, Vrnjačka Banja, Serbia, June 2 – 5, 2014, pp. ROI1.2. 1-6, ISBN 978-86-80509-70-9. (received the Best paper award)
27. **Petrović, P. B.**, Lukic, N., Danilov, I., "Robot-Assisted 3D Medical Sonography", pp. 45-61, Chapter 4 in: Rodic, A., Pisl, D., Bleuler, H. (Eds.), "New Trends in Medical and Service Robots - Challenges and Solutions", Series: Mechanisms and Machine Science, Vol. 20, Springer International Publishing, 2014., ISBN 978-3-319-05430-8, ISSN 2211-0984, DOI 10.1007/978-3-319-05431-5.
28. **Petrović, P. B.**, Lukić, N., Danilov, I.: Configuration Based Compliance Control of Industrial Humanoids, Proceedings of the 17th International Multiconference, INFORMATION SOCIETY – IS 2014, Volume F ROBOTICS, October 2014, Ljubljana, Slovenia, pp. 25-29.
29. Jakovljević, Z., **Petrović, P. B.**, Milkovic, D. D., Pajic M., Diagnosis of Irregularities in the Robotized Part Mating Process Based on Contextual Recognition of Contact States Transitions, Journal on Assembly Automation 2015 35 (2):pp.190-199, ISSN: 0144-5154, <http://dx.doi.org/10.1108/AA-10-2014-077>.
30. **Petrović, P. B.**, Lukic, A.N.: Configuration-based Compliance Control of Kinematically Redundant Robot Arm, Part I – Theoretical framework, FME Transactions, Vol. 45, No. 4, pp. 468-474, 2017, doi:10.5937/fmet1704468P
31. **Petrović, P. B.**, Danilov, R.I.: Configuration-based Compliance Control of Kinematically Redundant Robot Arm, Part II – Experimental validation, FME Transactions, Vol. 45, No. 4, pp. 475-480, 2017, doi:10.5937/fmet1704475P
32. Sorgini, F., Massari, L., D'Abbraccio, J., Palermo, E., Menciassi, A., **Petrović, P. B.**, Mazzoni, A., Carrozza, M. C., Newell, F. N., Oddo, C. M., Neuromorphic Vibrotactile Stimulation of Fingertips for Encoding Object Stiffness in Telepresence Sensory Substitution and Augmentation Applications, Sensors 2018, 18(1), 261; doi:10.3390/s18010261, pp:1-18
33. Lukic, N. and **Petrović, P. B.** (2019) "Complementary projector for null-space stiffness control of redundant assembly robot arm", Assembly Automation, Vol. 39 No. 4, pp. 696-714, DOI:10.1108/AA-10-2018-0163, ISSN: 0144-5154, <https://doi.org/10.1108/AA-10-2018-0163>
34. J. D'Abbraccio, L. Massari, S. Prasanna, L. Baldini, F. Sorgini, G. Airò Farulla, A. Bulletti, M. Mazzoni, L. Capineri, A. Menciassi, **P. B. Petrović**, E. Palermo, and C. Oddo, Haptic Glove and Platform with Gestural Control For Neuromorphic Tactile Sensory Feedback In Medical Telepresence, Sensors 2019, 19, 641; doi:10.3390/s19030641, pp:1-13.
35. F. Sorgini, G. A. Farulla, N. Lukic, I. Danilov, L. Roveda, M. Milivojevic, T. B. Pulikottil, M. C. Carrozza, P. Prinetto, T. Tolio, C. M. Oddo, **P. B. Petrović**, B. Bojovic, Tactile sensing with gesture-controlled collaborative robot, Proceedings of 2020 IEEE International Workshop on Metrology for Industry 4.0 & IoT (MetroInd4.0&IoT), ISBN: 978-1-7281-4891-5, pp.364-368 online 3-5. June 2020.
36. Z. Chen, X. Xu, A. Rodic, and **P.B. Petrović**, (2021) Motion Planning of 7-DOF Manipulator Based on Quintic B-Spline, 6th IEEE International Conference on Advanced Robotics and Mechatronics (ICARM), July 3-5, 2021, Chongqing, China; DOI: 10.1109/ICARM52023.2021.9536089.
37. A. Dević, N. Lukić, L. Matijašević, **P.B. Petrović**, (2021) Linking CAD Modeler and XR Engine for Digital Twin-Based Collaborative Robotic Assembly; Proc. 38th International Conference on Production Engineering of Serbia - ICPE-S 2021, Čačak, 05.10.2021, ISBN: 978-86-7776-252-0.
38. Tianya You, Hao Wu, Xiangrong Xu, **Petar B. Petrović**, Aleksandar Rodić, A Proposed Priority Pushing and Grasping Strategy Based on an Improved Actor-Critic Algorithm, Systems & Control Engineering, Electronics 2022, 11, 2065. <https://doi.org/10.3390/electronics11132065>