Piotr Gierlak

university teacher, Ph.D.
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Citizenship Polish

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Work Experience

10/2011 **RZESZOW UNIVERSITY OF TECHNOLOGY,**
DEPARTMENT OF APPLIED MECHANICS AND ROBOTICS
adjunct
Responsibilities:
lectures: dynamics of machines, applied mechanics
Achievements:
- 26 scientific publications in national and international journals
- 2 monographs
- 2 textbooks (on robot control, on artificial intelligence methods)
- participation in seventeen national and international scientific conferences
- 6 commissioned works for the mechanical industry (steelworks) and aviation industry (Pratt & Whitney Rzeszow)

02/2008-10/2011 **RZESZOW UNIVERSITY OF TECHNOLOGY,**
DEPARTMENT OF APPLIED MECHANICS AND ROBOTICS
assistant
Responsibilities:
laboratory classes: robot control, dynamics of machines, applied mechanics

Education

10/2007-07/2011 **RZESZOW UNIVERSITY OF TECHNOLOGY,**
THE FACULTY OF MECHANICAL ENGINEERING AND AERONAUTICS
Diploma thesis:
Neural control of manipulator's motion
Achievements:
Doctorate, (scientific discipline - mechanics)

10/2002-06/2007 **RZESZOW UNIVERSITY OF TECHNOLOGY,**
THE FACULTY OF MECHANICAL ENGINEERING AND AERONAUTICS
Diploma thesis:
Kohonen neural network in the inverse kinematics problem of manipulator
Achievements:
Master of Sciences (mechatronics)

Specialty

mechanics (modelling of manipulators and their environment)
robotics and control (adaptive and robust control, hybrid position/force control of manipulator, artificial intelligence methods for manipulator control, robotized machining)
mechanical vibration (discrete modeling of vibratory systems, measurements and analysis of vibration)

Skills

control and measurement devices
knowledge of rapid prototyping boards
measurements and analysis of vibration

Projects

01/2011 - 12/2011 Artificial intelligence methods in position/force control of manipulator

01/2012 - 12/2012 The implementation of intelligent position-force control of the manipulator in the machining process

01/2013 - 12/2013 The implementation of a robotic manipulator in the machining

01/2014 - 12/2014 Robotization of machining of the selected components surface

01/2015 - 12/2015 Analysis of mechanical vibrations in the robotic machining

01/2013 - 12/2015 Designing the process of robotized deburring of variable shape parts of aircraft engines with the use of an automatic adaptation of the tool trajectory

01/2013 – 12/2016 Optimization and monitoring of the machining process of thin walled aircraft engine assemblies using intelligence computational methods

Main publications

2009 Gierlak, P., Żylski, W.: Tracking control of manipulator. In: Methods and Models in Automation and Robotics, ifac-papersonline.net, vol. 14, part 1, 2009.

2010 Żylski W., Gierlak P.: Verification of Multilayer Neural-Net Controller in Manipulator Tracking Control, Solid State Phenomena Vol. 164, 2010, Page No. 99-104, Trans Tech Publications, Switzerland.

Gierlak P., Szuster M., Żylski W.: Discrete Dual-Heuristic Programming in 3DOF Manipulator Control. In: L. Rutkowski et al. (Eds.): ICAISC 2010, Part II, LNAI 6114, Page No. 256–263, 2010, Springer-Verlag Berlin Heidelberg.

2012 Gierlak P.: Hybrid Position/Force Control of the SCORBOT-ER 4pc Manipulator with Neural Compensation of Nonlinearities. In: L. Rutkowski et al. (Eds.): ICAISC 2012, Part II, LNCS 7268, Page No. 433–441, 2012, Springer-Verlag Berlin Heidelberg.

Gierlak, P., Żylski, W.: Adaptive hybrid position/force control of manipulator. Int. J. of Applied Mechanics and Engineering, 2012, vol.17, No.3, Page No. 811-825.

2014 Gierlak P.: Hybrid position/force control in robotised machining. Solid State Phenomena Vol. 210 ,2014, Page No. 192-199, Trans Tech Publications, Switzerland.

Hendzel Z., Burghardt A., Gierlak P., Szuster M.: Conventional and fuzzy force control in robotised machining. Solid State Phenomena Vol. 210 ,2014, Page No. 178-185, Trans Tech Publications, Switzerland.

Gierlak P., Muszyńska M., Żylski, W.: Neuro-fuzzy control of a robotic manipulator. Int. J. of Applied Mechanics and Engineering, 2014, vol.19, No.3, Page No. 575-584.

Gierlak P.: Adaptive control of the Scorbot-ER 4PC manipulator. Zeszyty naukowe Politechniki Rzeszowskiej 290, Mechanika 86, Vol. XXXI, No. 86 (4/14), 2014, Page No. 501-516.

Żylski W., Gierlak P.: Tracking control of manipulators. Rzeszow University of Technology, Page No. 1-203, 2014, ISBN: 978-83-7199-940-2

2015 Gierlak P.: The Application of Neural Position/Force Control in a Robotised Machining Process. Solid State Phenomena Vol. 220-221, 2015, Page No. 49-54, Trans Tech Publications, Switzerland.

T. Żabiński, T. Mączka, J. Kluska, M. Kusy, P. Gierlak, R. Hanus, S. Prucnal, J. Sęp: CNC Milling Tool Head Imbalance Prediction Using Computational Intelligence Methods, Lecture Notes in Artificial Intelligence LNAI 9119 (L. Rutkowski et al. Eds.), Springer International Publishing Switzerland, Part I ,2015, Page No. 503-514.

Gierlak P., Burghardt A., Szybicki D., Szuster M., Muszyńska M.: The manipulator tool fault diagnostics based on vibration analysis. In: Dynamical Systems. Mathematical and Numerical Approaches, (J. Awrejcewicz et al. Eds.), Łódź 2015, Poland, Page No. 211-222.

Burghardt A., Szybicki D., Gierlak P., Kurc K., Muszyńska M.: Robotic automation of the turbo-propeller engine blade grinding process. In: Mechatronics and Life Sciences, (J. Awrejcewicz et al. Eds.), Łódź 2015, Poland, Page No. 121-130.

2016 Gierlak P., Szuster M.: The manipulator tool fault diagnostics based on vibration analysis in the frequency domain. Applied Mechanics and Materials, Vol. 817, 2016, Page No. 234-244, Trans Tech Publications, Switzerland.

Muszyńska M., Gierlak P.: Advanced neuro-fuzzy system in the task of position-force control of a manipulator. Applied Mechanics and Materials, Vol. 817, 2016, Page No. 81-92, Trans Tech Publications, Switzerland.

Szuster M., Gierlak P.: Globalized Dual Heuristic Dynamic Programming in Control of Robotic Manipulator. Applied Mechanics and Materials, Vol. 817, 2016, Page No. 150-161, Trans Tech Publications, Switzerland.

Szuster M., Gierlak P.: Approximate Dynamic Programming in Tracking Control of a Robotic Manipulator. International Journal of Advanced Robotic Systems, in print.

International conferences

08/2009	14 IFAC International Conference on Methods and Models in Automation and Robotics (MMAR), Miedzyzdroje, Poland
10/2009	The 5th International Conference on Mechatronic System and Materials (MSM), Vilnius, Lithuania
06/2010	The 10th International Conference on Artificial Intelligence and Soft Computing (ICAISC), Zakopane, Poland
05/2012	The 11th International Conference on Artificial Intelligence and Soft Computing (ICAISC), Zakopane, Poland
07/2013	The 9th International Conference Mechatronic Systems and Materials (MSM), Vilnius, Lithuania
12/2013	The 12th International Conference on Dynamical Systems – Theory and Applications (DSTA), Lodz, Poland
09/2014	The 24 International Conference on Theory of Machines and Mechatronic Systems (TMM), Szklarska Poreba, Poland
12/2015	The 13th International Conference on Dynamical Systems – Theory and Applications (DSTA), Lodz, Poland