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Effective Robotics Education: Surveying Experiences of Master Program Students in Introduction to Robotics Course

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Abstract

© The Authors, published by EDP Sciences, 2018. Technology-driven world poses new challenges for the modern education system. To prepare skilled specialists for academic and industrial needs it is important to create competitive educational ground. Our team works on developing and implementing world-class master program in Intelligent Robotics. To pave the way for a high-quality educational program we invest efforts into studying students' attitude and motivation for connecting their professional life with robotics. In this paper we describe the curriculum for master program that was designed and implemented at the Higher Institute of Information Technology and Information Systems at Kazan Federal University and present the results of our continuous research of comparative analysis of surveys among students of Introduction to Robotics course.

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References

[1] T. Tsoy, L. Sabirova and E. Magid, Towards Effective Interactive Teaching and Learning Strategies in Robotics Education, IEEE 10th Int. Conf. on Developments in eSystems Engineering, pp. 267-272, (2017).

[2] T. Tsoy, L. Sabirova, M. Abramsky and E. Magid,. 2018. Establishing Effective Teaching for Robotics: A comparison study of Bachelor students participated in Introduction to Robotics course. In The 2018 Int. Conf. on Artificial ALife and Robotics, pp. 212-215, (2018).

[3] Kit G. Tkhagapsoyev, M. M. Yakhutlov, "Problems of engineering education in modern Russia: The methods of analysis and ways of solving. In Higher education in Russia, No 8-9, pp. 27-36, (2014).

[4] L. Ogorodova, V. Kress, Y. Pokholkov, Engineering education and engineering in Russia: problems and solutions. In Engineering education, pp. 18-23, (2012).

[5] Decree of the Government of the Russian Federationon December 8, # 2227-r on The Strategy for Innovative Development of the Russian Federation until 2020, (2011).

[6] M. Rosenblatt, H. Choset, Designing and implementing handson robotics labs. In IEEE Intelligent Systems and their Applications, vol. 15 (6), pp. 32-39, (2000).

[7] N.A. Shmatko and G.L. Volkova, (2017). Robotics: The need for organizations in scientific personnel and competencies, Science, Technology and Innovations series, Institute for Statistical Studies and Economics of Knowledge, The National Research University-Higher School of Economics, URL: https://issek.hse.ru/data/2017/05/29/1172143877/NTI-N-53-19052017.pdf

[8] E. Ospennikova, M. Ershov, I. Iljin, Educational Robotics as an Inovative Educational Technology. In Procedia-Social and Behavioral Sciences, v. 214, pp. 18-26, (2015).

[9] Y. P. Pokholkov, National Doctrine of Advanced Engineering Education of Russia in the Context of New Industrialization: Approaches to Development, Objectives, and Principles. In Engineering education, Association of Engineering Education of Russia, vol. 10, pp. 50-65, (2012).

[10] B. A. Maxwell, L. A. Meeden, Integrating robotics research with undergraduate education. In IEEE Intelligent systems and their applications, v. 15, #. 6, pp. 22-27, (2000).

[11] E. Kolberg, Y. Reich, I. Levin, Project-based high school mechatronics course. In Int. Journal of Engineering Education, v. 19, #. 4, pp. 557-562, (2003).

[12] I. Mavrin, R. Lavrenov, M. Svinin, S. Sorokin, and E. Magid, Remote control library and GUI development for Russian crawler robot Servosila Engineer. In MATEC Web of Conf., vol. 161, p. 03016. EDP Sciences, (2018).

[13] E. Magid, R. Lavrenov, and A. Khasianov, Modified spline-based path planning for autonomous ground vehicle. In Proceedings of Int. Conf. on Informatics in Control, Automation and Robotics, pp. 132-141, (2017).

[14] J. Pages, L. Marchionni, and F. Ferro, TIAGo: The modular robot that adapts to different research needs. In Int. Workshop on Robot Modularity, IROS, (2016).

[15] E. Magid and A. Sagitov, Towards Robot Fall Detection and Management for Russian Humanoid AR-601. In KES Int. Symposium on Agent and Multi-Agent Systems: Technologies and Applications, Springer, Cham, pp. 200-209, (2017).

[16] Ch. N. Thai,. 2017. Hardware Characteristics. In Exploring Robotics with ROBOTIS Systems, Springer, Cham, pp. 23-62., (2017).

[17] G. Veruggio, Roboethics. In IEEE Robotics & Automation Magazine, vol. 17 (2), p. 105-109, (2010).

[18] S. Tadokoro, ed., Rescue robotics: DDT project on robots and systems for urban search and rescue. In Springer Science & Business Media, (2009).

[19] G. Dudek and M. Jenkin, Computational principles of mobile robotics, Cambridge university press, (2010).

[20] J. J. Craig, Introduction to Robotics, 3rd ed., Pearson/Prentice Hall, (2005).

[21] P. Corke, Robotics, vision and control: fundamental algorithms in MATLAB, Springer, (2011).