

AMBIENT INTELLIGENCE FOR AGRICULTURAL PRODUCTION IN CONDITIONS OF DIGITAL TRANSFORMATION

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The article identifies the main areas of research in the field of enveloping intelligence systems that are relevant at the present stage of world development. Brief results of the review of the “smart technologies” market are presented, trends in the application of decision-making systems in the field of agriculture are noted. The issue of increasing labor productivity in agricultural production through automation and the introduction of robotics is being actualized. As a result of the study, it was found that farms of various types have a need to automate the harvesting process, which led to further directions of analysis. An overview of the current state of the world agricultural robot market is presented and its key players are identified.

Keywords: intelligent habitats, digital transformations, digital field, multi-agent self-organization processes, agriculture, automation and robotization of agricultural production; labor productivity.

REFERENCES

1. Shalova S.H. *Obzor i analiz issledovaniy v oblasti sistem obvolakivayushchego intellekta* [Review and analysis the research in enveloping intelligence systems] // Inzhenernyy vestnik Dona. 2016. № 4(43). Pp. 125.
2. World Agricultural Production. Global Market Analysis November 2020 report // United States Department of Agriculture (USDA). Foreign Agricultural Service
3. Shalova S.H., Zagazezheva O.Z. *Obzor rynka sel'skohozajstvennyh robotov i ih vlijanie na ekonomicheskoe razvitiye* [Agricultural robot market overview and their impact on economic development] // Tehnicheskie nauki. Technical Sciences. Southern Federal University. 2019. № 7. Pp. 57-70.
4. Shalova S.H. *Obzor intellektual'noj sredy obitanija dlja sel'skohozajstvennogo proizvodstva v uslovijah cifrovyh transformacij* [An overview of smart habitats for agricultural production in a digital transformation] // Perspektivnyye sistemy i zadachi upravleniya: materialy XV Vserossijskoy nauchno-prakticheskoy konferentsii i XI molodezhnoy shkoly-seminara «Upravlenije i obrabotka informatsii v tekhnicheskikh sistemakh», Perspective systems and tasks of management: Materials of the 15th all-Russia Scientific-practical Conference. Southern Federal University. Rostov-na-Donu; Taganrog: YUFU Publishing House, 2020. Pp. 157-163
5. Ivanov P.M., Nagoev Z.V., Kudaev V.Ch., Makarevich O.B., Hamukov Ju.H., Tokmakova D.G. *Avtomatischeskoe formirovanie konteksta situacij v sistemah obvolakivajushhej bezopasnosti na osnove mul'tiagentnyh kognitivnyh arhitektur* [Automatic formation of the context of situations in enveloping security systems based on multi-agent cognitive architectures] // News of the Kabardino-Balkarian Scientific Center of RAS. 2015. № 1 (63). Pp. 23-31.
6. Hadzhieva M.I., Shalova S.H., Kanokova M.A. *Teoreticheskie aspekty vnedrenija robotizacii i avtomatizacii v agropromyshlennyj kompleks regiona* [Theoretical aspects of the implementation of robotization and automation in the agro-industrial complex of the region] // News of the Kabardino-Balkarian Scientific Center of RAS. 2019. № 6 (92). Pp. 171-177.

7. Agri Food Tech Investing Report Year In Review 2018. [electronic resource] // AgFunder. URL: <https://agfunder.com/research/agrifood-tech-investing-report-2018/>.
8. Anchakov M.I., Kil'chukova A.L., Shalova S.H. *Reshenie problem avtomatizacii processa sbora plodoovoshchnoj produkci* [Solving the problems of automation of the process of collecting fruits and vegetables] // Inzhenernyy vestnik Dona./ Engineering Herald of the Don. 2016. № 4(43). P. 73.
9. Agricultural Robots Market Shares, Strategies, and Forecasts, Worldwide, 2014 to 2020 [electronic resource] // Radiant Insights, Inc. URL: <https://docplayer.net/8723989-Application-server-market-size-shares-growth-analysis-trend-and-forecasts-report-2014-to-2020-radiant-insights-inc.htm>
10. *Ekspert. «Super-prognoz fundamentalnykh faktorov sel'skogo khozyajstva na 2020-2029 gg. – OESR-FAO».* «Super-forecast of fundamental factors of agriculture for 2020-2029. OECD-FAO». [electronic resource] // Electronic journal IDK. Expert. URL: <https://exp.idk.ru/news/world/super-prognoz-fundamentalnykh-faktorov-selskogo-khozyajstva-na-2020-2029-gg-oehsr-fao/524407/>
11. Khasha Ghaffarzadeh. Agricultural Robots, Drones, and AI: 2020-2040: Technologies, Markets, and Players. [electronic resource] // IDTechEx Web Journal. URL: <https://www.idtechex.com/en/research-report/agricultural-robots-drones-and-ai-2020-2040-technologies-markets-and-players/749>
12. Anchakov M., Denisenko V., Nagoev Z., Sundukov Z., Tazhev B. Interactive Collaborative Robotics and Natural Language Interface Based on Multi-agent Recursive Cognitive Architectures Interactive Collaborative Robotics // Lecture Notes in Computer Science. 2016. Pp. 107-112.
13. OECD-FAO Agricultural Outlook 2019-2028. [Electronic resource] // OECD Publishing, Paris/Food and Agriculture Organization of the United Nations, Rome. URL: https://doi.org/10.1787/agr_outlook-2019-en
14. Maksimushkina E. *Roboty zamenyat sezonnih rabochih na uborke urozhaja* [Electronic resource]. URL: <https://www.vedomosti.ru/business/articles/2020/09/02/838497-roboti-zamenyat>
15. Verhoturov D. Roboty nakormjat ljudej [Electronic resource]. URL: <https://schriftsteller.livejournal.com/525577.html>.
16. Zagazezheva O.Z., Mambetov A.H. *Innovacionnye tehnologii kak faktor operezhajushhego razvitiya regiona* [Innovative technologies as a factor in advancing the region's development] // News of the Kabardino-Balkarian Scientific Center of RAS. 2017. № 6 – 2 (80). Pp. 97-101.
17. World Agricultural production, 2020 [Электронный ресурс]. URL: <https://apps.fas.usda.gov/psdonline/circulars/production.pdf>
18. RosInvest.Com. Robotics market. [electronic resource]. URL: http://rosinvest.com/acolumn/blog/high_technology/530.html

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