International Journal of Emerging Trends in Engineering Research, 2020, vol.8, N6, pages 2774-2778

Knowledge acquisition for engineering decisions based on functional relationships

Simonova L., Egorova E., Akhmadiev A.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2020, World Academy of Research in Science and Engineering. All rights reserved. This article is devoted to formation of a subject of engineering decision in intelligent system of development of production processes based on description of functional models of engineering capabilities upon decision making. A subject of design engineering decision is a complicated system including subsystems of various essence, which operate according to rules described by fizzy logics and study cases. Design engineering decision is formed as a consequence of combined operation of intelligent system modules: equipment selection module, tool selection module, and accessory selection module. Each module of design engineering decision is characterized by its unique properties of engineering design both at input and output of decision formation. Therefore, each module of intelligent system of development of production processes is considered as a complex system with inherent properties. The components of a given specific system, for instance, selection of metal cutting equipment, will be input parameters for specific system module. Output parameters of the system of selection of metal cutting equipment will be input parameters for the system of selection of cutting tools, etc.

http://dx.doi.org/10.30534/ijeter/2020/91862020

Keywords

Artificial intelligence, Cutting tools, Engineering decision, Fuzzy logics, Production process

References

[1] V.G. Shibakov. Intellektual'naya sistema formirovaniya tekhnologicheskikh protsessov shtampovochnogo proizvodstva na osnove CALS-tekhnologii [Intelligent system of formation of stamping processes based on CALS]. Ministry of Education and Science of the Russian Federation, Kama State Academy of Engineering and Economics. Moscow: Academia, 2011.

[2] L. Simonova. Informatsionnoe obespechenie upravleniya tekhnologicheskimi marshrutami. Integrirovannye informatsionnye sistemy v mashinostroenii [Data support of process route management. Integrated data systems in engineering industry]. LAP Lambert Academic Publishing GmbH & Co. KG, 2012.

[3] L.A. Simonova, E.I. Egorova. Modular representation of the product in the knowledge base in the technological process formation. International Scientific Conference, 2015. https://doi.org/10.1088/1757-899X/69/1/012042

[4] L.A. Simonova, E.I. Egorova. Development of structural element precedent of technological process in computer-aided design. International Scientific Conference, 2015. https://doi.org/10.1088/1757-899X/86/1/012017

[5] E.I. Egorova, L.A. Simonova. Ontologicheskaya model' predstavleniya informatsii o tekhnologicheskom protsesse detali [Ontological model of data presentation about production process of an item]. Nauchno-tekhnicheskii vestnik Povolzh'ya no. 11, pp. 247-255, 2018.

[6] L.A. Simonova, E.I. Egorova, A.I. Akhmadiev. Modul' formirovaniya marshrutov obrabotki poverkhnostei na osnove nechetkoi logiki [Modules of surface processing routes based on fuzzy logics]. Nauchno-tekhnicheskii vestnik Povolzh'ya no. 11, pp. 81-87, 2019.

[7] E.I. Egorova. Representation of Information about Part on The Basis of Its Engineering Features. International Journal of Innovative Technology and Exploring Engineering vol. 8 no. 12, 2019. https://doi.org/10.35940/ijitee.L3638.1081219

[8] G.B. Evgenev. Intellektual'nye sistemy proektirovaniya [Intelligent design systems]: Guidebook. Moscow: Bauman MGTU, 2009.

[9] G. Booch. Object-Oriented Analysis and Design with Applications. Boston: Addison Wesley Longman, 1994.

[10] T.A. Gavrilova, V.F. Khoroshevskii. Bazy znanii intellektual'nykh sistem [Knowledge database of intelligent systems]. St. Petersburg: Piter, 2000.