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SYNTHESIS OF THE MATH MODEL OF DELTA-ROBOT FOR USING IN TASKS OF SORTING WASTE

The problem of synthesis the kinematic models of industrial delta-robots is investigating in the article. Authors proposed universal method for solving invers task of kinematic. This method can be used for delta-robots with different quantity offaces. The developed method is oriented to using in automatic control systems of garbage sorting units. Efficiency of this method was confirmed by results of program modeling.

Keywords: delta-robot, math model, invers kinematic, industrial robot, automatic control system, waste sorting.

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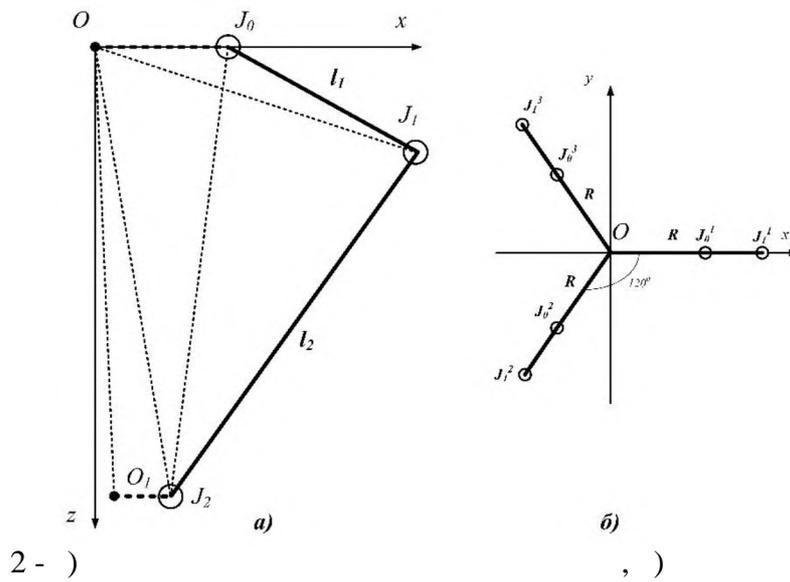
[4]

[5]

n ,
 $- O_1$, O_1
 l_1 , l_2
 (\dots) , Oz , XOY , Ox , O
 J_0, J_i, J_2 , O
 OJ_0J_1

J_0, J_1, J_2

180°



XOY

J_0, J_1, J_2 , l_1
 OJ_0, J_1, J_2 , R , J_0
 OJ_0, J_1, J_2 , J_0

OJ_0J_2 , $J_0J_1J_2$, OJ_1J_2 , OJ_2O_1 , Ox

$$\begin{aligned} X &= R \cos(2^\wedge - \quad), \\ &= R \sin(2^\wedge - \quad), \\ Z &= 0, \end{aligned} \quad (1)$$

$$JOJ_qJ_2 = \arccos \left(\frac{|OJ_0|^2 + |J_0J_2|^2 - |OJ_2|^2}{2|OJ_0||J_0J_2|} \right) \quad (2)$$

(1), (2)

$$\begin{aligned} X &= R + \wedge \cos(\wedge - P) \cos(2^\wedge - \quad), \\ &= R + \wedge \cos(\wedge - \quad) \sin(2^\wedge - \quad), \\ z &= \wedge \sin(\quad - \quad), \end{aligned} \quad (3)$$

 $l_1 -$ $J^\wedge J!$

(3),

3

K

K

rot -

$$N(K) = K(ro^\wedge + ro^\wedge + ro^\wedge + tran),$$

, tran -

rfMujwjKTW

5. Coronado E., Maya M., Cardenas A., Guameros O., Piovesan D. Vision-based Control of a Delta Parallel Robot via Linear Camera-Space Manipulation // Journal of Intelligent & Robotic Systems. - 2017. V. 85(1). - P. 93-106.

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