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BASIS FOR MOVING INDUSTRIAL ROBOTS SPEED PROBLEM

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ANNOTATION

The Ministry of Development of Information Technologies and Communications of the Republic of Uzbekistan implemented operational issues in accordance with the conditions of the three hil Kussi dampfir, kusli dampfir and critic dampfir.

Keywords ; technologist is hot, equation, dynamic coefficient, damper.

At present, the education carried out in our country, testes is and taxi engines are foreign investment to repair with Ted-try problems sorry, all this concerns, the development of chierisi modernization and technical expertise of technology, malilises problem programs are not given much attention aamet. Quality assessment based on automation in the production of foreign enterprises this year? the data preparation requirement is daily gibberish. The productivity of automated work is great in the kizikish that is found in robots, especially industrial robots. Automation of production through the development of industrial robots, and secondly, thanks to market relations, industrial robots perform various development functions in exchange for low consumption of variable products. To do this, today's requirement is to conduct master research work on industrial robots.

Judging by the mobility of the base, industrial robots are two-sided biladies: the base is movable, and the base is fixed. Caracat, which is the basis of mobile industrial robots, is based on three mechanisms: moving the base, moving the intermediate links, and moving the gripper. One of the requirements is speed, the basis come in industrial robot technologist Jaraene Eki, technologist. The off-budget pension fund under the Ministry of Finance of the Republic of Uzbekistan is a pillar for rapid development. The reason is that if the issue of speed is called the basis, then this can lead to a Bazharian mechanized state[1].

[1] yes, industrial robotics expressed as follows:

(one)

Industrial robots in the lekinalati izharm coefficient are not known to be differential at the input of the equation, but perhaps a variable coefficient differential equation, i.e. at input input :

$$\alpha_i(t)\ddot{x}(t) + \beta_i(t)\dot{x}(t) + x(t) = \tau_i(t) \quad (2)$$

(1) and (2) - if we consider them in relation to the control function of the equations:

(2)
$$\ddot{y}(t) = \frac{1}{a_i}[\tau(t) - b_i\dot{y}(t) - y(t)], \quad \frac{\tau(t)}{a_i} = \bar{u}_i(t), \frac{b_i}{a_i} = \bar{b}_i, \frac{1}{a_i} = d_i.$$

$$\ddot{y}(t) + \bar{b}_i\dot{y}(t) + d_i y(t) = \bar{u}_i(t) \qquad (3)$$

$$\ddot{x}(t) = \frac{1}{\alpha_i(t)}[\tau(t) - \beta_i(t)\dot{x}(t) - x(t)], \frac{\tau(t)}{\alpha_i(t)} = u_i(t), \frac{\beta_i(t)}{\alpha_i(t)} = \bar{\beta}_i(t), \frac{1}{\alpha_i(t)} = c_i(t).$$

$$\ddot{x}(t) + \bar{\beta}_i(t)\dot{x}(t) + c_i(t)x(t) = u_i(t) \text{(four)}$$

(3) and if equations (4) are subtracted from each other:
$\ddot{x}(t) - \ddot{y}(t) + \overline{\beta}_i(t)\dot{x}(t) - \overline{b}_i\dot{y}(t) + c_i(t)x(t) - d_i y(t) = u_i(t) - \overline{u}_i(t).$ (5)

(5) for the equation we use the notation from the previous paragraph.

$\ddot{e}(t) + k_i^1\dot{e}(t) + k_i^2 e(t) = \delta u_i(t)$ (6)

(6) the equation can have two cases with respect to dynamic coefficients [2]:

1) if in any time situation $k_i^1 - k_i^2 < 0$ if the condition is met, then the weak state of the damper.;

1) 1) if in any time situation $k_i^1 - k_i^2 \geq 0$ if the condition is met, then a strong and critical state of the damper occurs.

(6) when new variables are introduced for the equation, $\delta u_i(t) = v_i(t)$ if, then $|v_i(t)| \leq 1$ in each time situation, from the beginning to the coefficient and $k_i^1 > 0, k_i^2 > 0$ let the condition be given.

(6) the equation can be written as a system of equations as follows:

$$\dot{e} = z, \quad \ddot{e} = \dot{z}$$

$$\begin{bmatrix} \dot{e} \\ \dot{z} \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ -k_i^2 & -k_i^1 \end{bmatrix} \cdot \begin{bmatrix} e \\ z \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} v$$

(6) when solving the problem of velocity for a system of equations, first of all, it is H necessary to compile the Hamilton function.

$$H = \eta_1 z + \eta_2(-k_i^1 z - k_i^2 e) + \eta_2 v.$$

ªa Oshma's system is as follows:

$$\begin{cases} \dot{\eta}_1 = -\dfrac{\partial H}{\partial e} = -k_i^2\eta_2 \\ \dot{\eta}_2 = -\dfrac{\partial H}{\partial z} = -\eta_1 + k_i^1\eta_2 \end{cases}$$

As you know,

$$\eta_2 \neq 0, \qquad \eta_1 = k_i^1\eta_2 - \dot{\eta}_2 \qquad \Rightarrow \qquad \dot{\eta}_1 = k_i^1\dot{\eta}_2 - \ddot{\eta}_2,$$

$$k_i^1\dot{\eta}_2 - \ddot{\eta}_2 = k_i^2\eta_2$$

$$\ddot{\eta}_2 - k_i^1\dot{\eta}_2 + k_i^2\eta_2 = 0.$$

Solution of the last equation

$$\eta_2 = c_1 e^{k_i^1 t}\sin(wt + c_2),$$

$$\eta_1 = -\int c_1 k_i^2 e^{k_i^1 t}\sin(wt + c_2)dt.$$

here $c_1 \neq 0$, $\quad c_2$ – optional invariant.

$$w = \sqrt{k_i^2 - (k_i^1)^2}.$$

The time interval in the sequence of interchange (switching) in such a way that the trajectory of solving the equation has the form of a sinusoid $T = \frac{\pi}{w}$ is equal to [2].

Given that the control function reaches its maximum and minimum values at the limit, equation (6) can be written as a system of equations as follows:

$$\dot{e} = z,\ \ \dot{z} = -k_i^2 e - k_i^1 z - 1 (7)$$

$$\dot{e} = z,\ \ \dot{z} = -k_i^2 e - k_i^1 z + 1 (\text{eight})$$

(6) the solution of the equation is compared with the solution of equation (7) in each time situation. (7) in order for the equation to fully reflect the movement of industrial robots, it must tend to zero along a given trajectory. But this option contradicts the opinion presented in [3]. (7) deviation of the trajectory around certain points (equilibrium position) for the equation: $e = -\frac{1}{k_i^2}$, $z = 0$ and this case from the condition O_- assume.

(8) deviation of the trajectory around certain points (equilibrium position) for the equation: $e = \frac{1}{k_i^2}$, $z = 0$ and this case from the condition O_+ to assume.

Without this, the plot of the exchange curve for equation (6) would be as follows (Fig. 1): (6) for the equation, the function that synthesizes the solution is defined as:

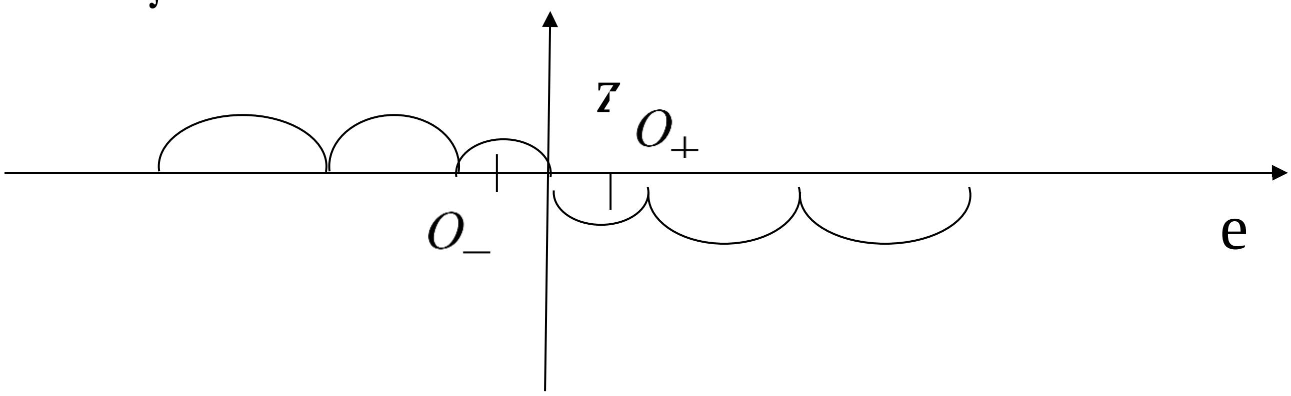
$$\ddot{e}(t) + k_i^1 \dot{e}(t) + k_i^2 e(t) = \Psi(e, z)$$

$$\Psi(e,z) = \begin{cases} -1, & z > 0,\ (7)\ \ \text{тенглама ечими.} \\ 1, & z < 0,\ (8)\ \ \text{тенглама ечими.} \end{cases}$$

The speed problem was solved for weak damping.
This solves the issue of speed for both critical and strong damping.
In this case, the condition substituted into equation (6) is divided by two.
one). For the critical state of the damper $k_i^1 - k_i^2 = 0$.
Under this condition, the joint system solution

$$\eta_2 = e^{k_i^1 t}(c_1 + c_2 t),$$

$$\eta_1 = -\int k_i^2 e^{k_i^1 t}(c_1 + c_2 t)dt.$$



7) and (8) from the equations or explanation. Estimation of the trajectory of the tekilikda Descartes coordinator systematized ikkinchi and four-wheeled tuttinchi etadi (2-Figure).
Industrial robots use their complex manipulation operations at two points, namely M_0 from the point of view M_1, in a continuous situation of time, a set of trajectories is formed while ensuring continuous migration to a point. To find out how close the trajectories are to the trajectories of solutions to equation (1) or (2) $k_i^1 - k_i^2 < 0$ weak damper and $k_i^1 - k_i^2 \geq 0$ it is necessary to know the critical or strong cases of the damper.
If there is a weak state of the damper, then the trajectory (1) will be close to the trajectory of solutions to the equation.
If there is a critical or strong state of the damper, then trajectory (2) will be close to the trajectory of solutions to the equation.

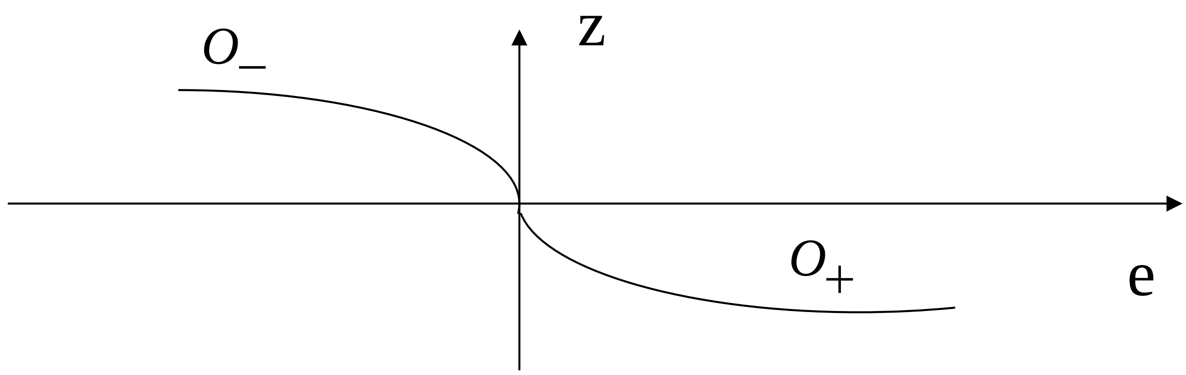


Рисунок 2. (6) график кривой обмена для уравнения.

В этом,

$$|v| \leq 1, \qquad k_i^1 - k_i^2 \geq 0, \qquad k_i^1 > 0, \qquad k_i^2 > 0$$

для случаев.

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