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$$\begin{cases} P_{ij}^k(t) = \frac{[\tau_{ij}]^\alpha \cdot [\eta_{ij}]^\beta}{\sum_{j \in J_i^k} [\tau_{ij}]^\alpha \cdot [\eta_{ij}]^\beta}, & j \in J_i^k \\ P_{ij}^k(t) = 0, & j \notin J_i^k \end{cases} \quad (1)$$

α β - α = 0, β = 0,

" \emptyset - , 2012. 9 : , , " . [1]

k (-j)

$$\Delta\tau_{ij}^k(t) = \begin{cases} \frac{Q}{L^k(t)}, & (i, j) \in T^k(t) \\ 0, & (i, j) \notin T^k(t) \end{cases}$$

$T^k(t)$ - , k ; $L^k(t)$ $\hat{\delta}$; Q $\hat{\delta}$. [1]

$\hat{\delta}$

$\in [0,1]$.

$$\tau_{ij}(t+1) \leftarrow (1-p)\tau_{ij}(t) + \Delta\tau_{ij}(t), \quad (2)$$

$$\Delta\tau_{ij}(t) = \sum_{k=1}^m \tau_{ij}^k(t); \quad m -$$

τ_0 .

$\hat{\delta}$. [1]

L+ $\hat{\delta}$, +, +, Q/L+, +

+ e +, eQ/L +,

(Rank-Based Ant Systems),

(Ant Colony Systems),

(- IN

Ant Systems).

. [1]

$\hat{\delta}$

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2- t, 3- t -

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(« »)

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Ant-Q . [3]

1995

Q-learning.

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Q-
« Q- »

Ant Colony System . [3]
1997

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Max-min Ant System . [3]

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ASrank . [3]

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main ().

α, β, Q, τ_0

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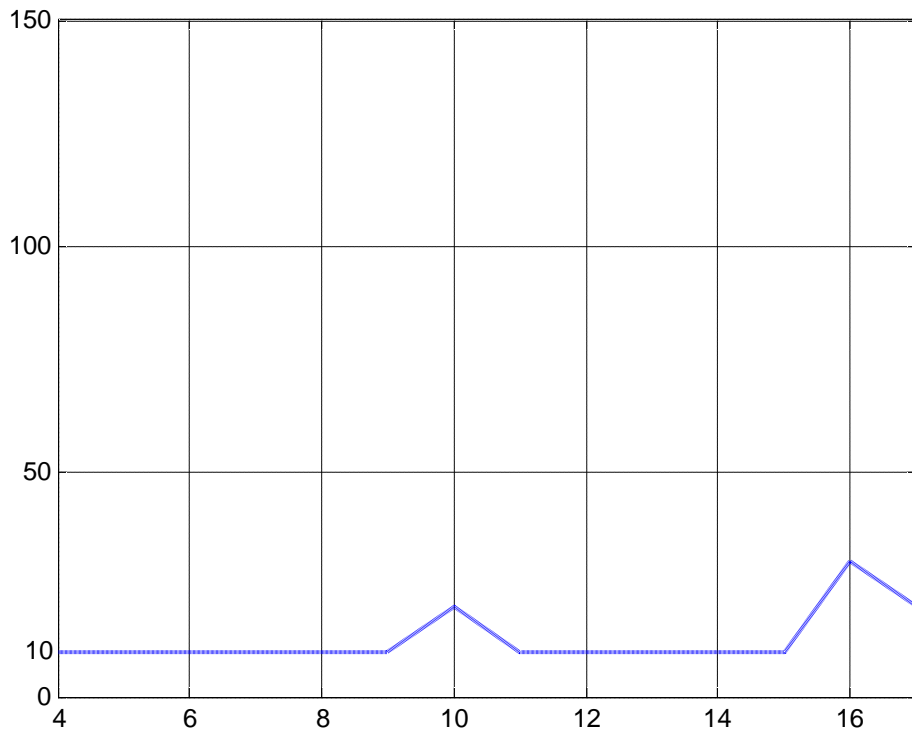
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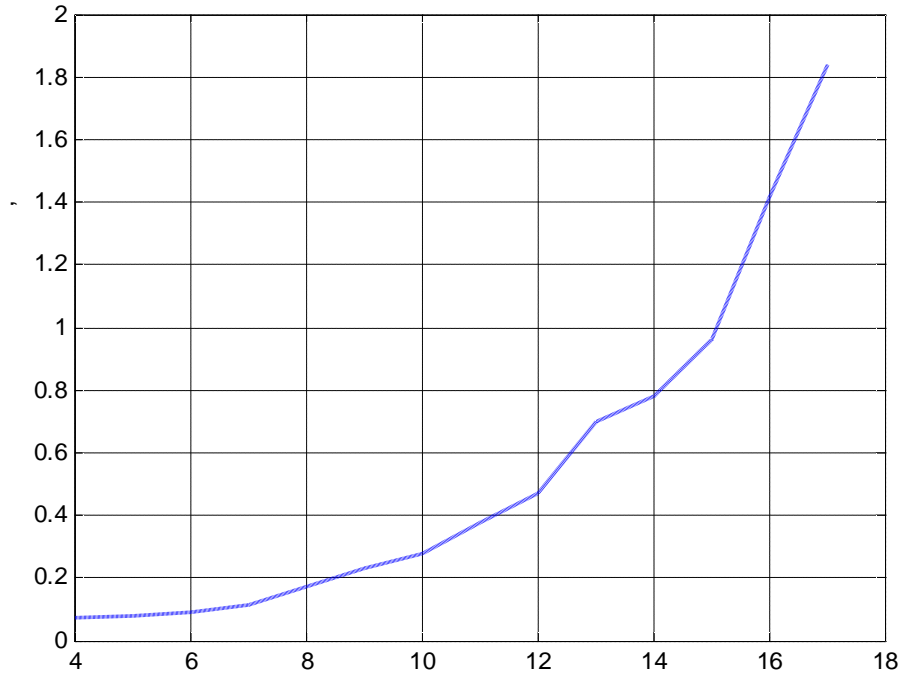
10.

α, β, Q, τ_0 .

(. 2).



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<http://habrahabr.ru/post/105302/> . ó