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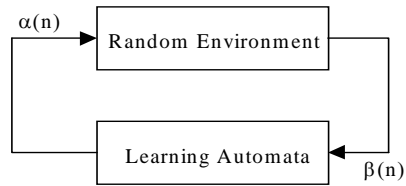
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[Mars96][Nare89].



$\alpha \equiv \{\alpha_1, \alpha_2, \dots, \alpha_r\}$

$E \equiv \{\alpha, \beta, c\}$

$c \equiv \{c_1, c_2, \dots, c_r\}$

$\beta \equiv \{\beta_1, \beta_2, \dots, \beta_m\}$

$\beta_2 = 0$

$\beta_1 = 1$

**P**

$\beta^{(n)} \mathbf{S}$

$[0,1]$

$\beta^{(n)} \mathbf{Q}$   
 $[0,1]$

$c_i$

$\alpha_i$

$c_i$

$\{\alpha, \beta, F, G, \phi\}$

$\phi \equiv \{\phi_1, \phi_2, \dots, \phi_s\}$

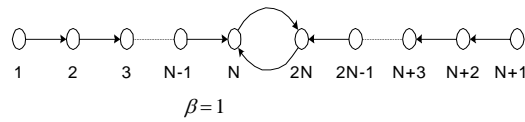
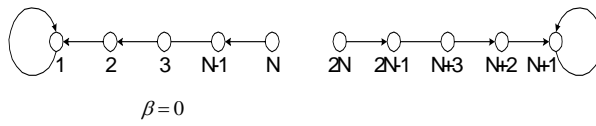
$\beta \equiv \{\beta_1, \beta_2, \dots, \beta_m\}$

$\alpha \equiv \{\alpha_1, \alpha_2, \dots, \alpha_r\}$

$G: \phi \rightarrow \alpha$

$F: \phi \times \beta \rightarrow \phi$

$L_{2N,2}$



$L_{2N,2}$

$\alpha_1$

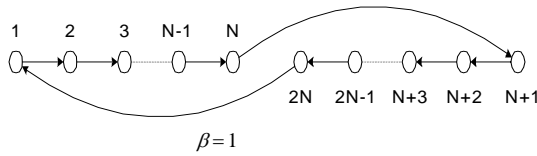
$N$

$\alpha_2$

$L_{2N,2}$

$G_{2N,2}$

$L_{2N,2}$



$G_{2N,2}$

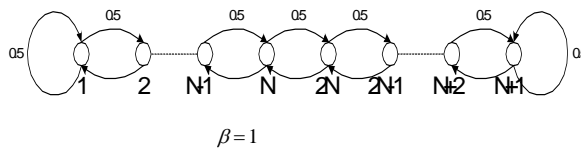
$L_{2N,2}$

$\phi_{i+1}$

$\phi_i (i \neq 1, N, N+1, 2N)$

Krylov

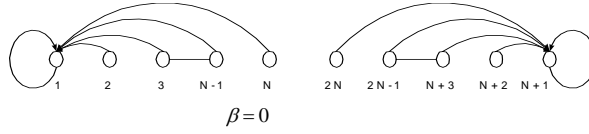
$\phi_{i-1}$



Krylov

Unfavorable  
Stationary  
Non-Stationary  
Fixed Structure  
Actions

$$L_{2N,2} \quad \phi_1 \quad \phi_i (i = 1, 2, \dots, N) \quad N \quad \phi_{N+1} \quad \phi_i (i = N + 1, N + 2, \dots, 2N)$$



Krinsky

$\{\alpha, \beta, p, T\}$

$$p = \{p_1, p_2, \dots, p_r\} \quad \beta \equiv \{\beta_1, \beta_2, \dots, \beta_m\} \quad \alpha \equiv \{\alpha_1, \alpha_2, \dots, \alpha_r\}$$

$$p_i(n+1) = \mathbb{T}[\alpha(n), \beta(n), p(n)]$$

$$p_i(n) \quad p_i(n) \quad p_i(n)$$

[Nare89]

$$p_i(n+1) = p_i(n) + a[1 - p_i(n)]$$

$$p_j(n+1) = (1 - a)p_j(n) \quad j \neq i \quad \forall j$$

$$p_i(n+1) = (1 - b)p_i(n) \quad p_j(n+1) = \frac{b}{r-1} + (1 - b)p_j(n) \quad \forall j \quad j \neq i$$

$$L_{R\&P} \quad a \quad b \quad L_{RP} \quad b \quad a$$

$$L_{RI} \quad b$$

[Nare89] [Mars96] [Meyb84] [Meyb82] [Laks81]

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Variable Structure  
 Linear Reward Pealty  
 Linear Reward Epsilon Penalty  
 Linear Reward Inaction

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(BallDir<sub>t</sub>)

(BallDist<sub>t</sub>)

(turn direction)

( )

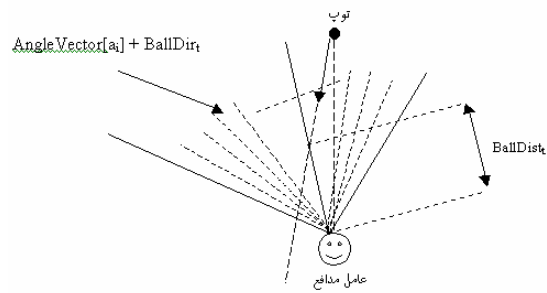
LRP

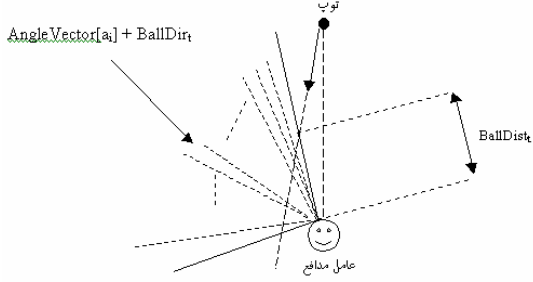
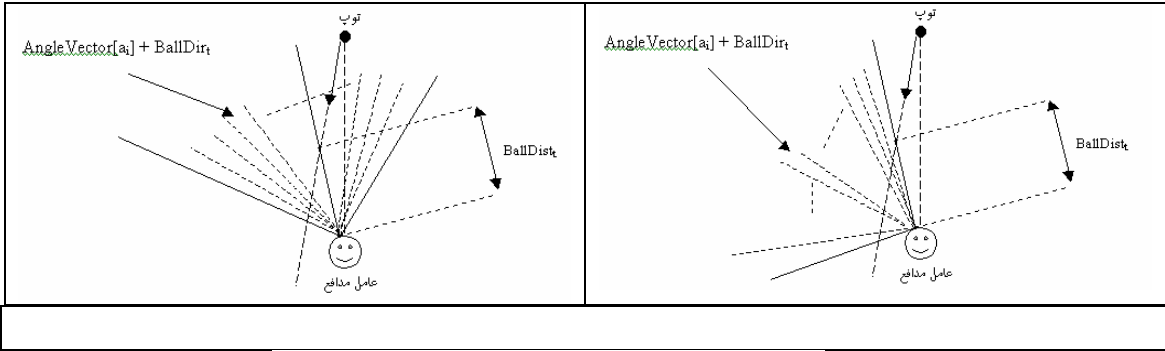
LRP

LRI

Pentium III 500

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LRI

: LRI

LRI

/

/ LRI :

%	%	%	%	%	%	
%	%	%	%	%	%	

LRI :

/	/	/	/	/	/	
%	%	%	%	%	%	
%	%	%	%	%	%	

L<sub>RP</sub>

: L<sub>RP</sub>

L<sub>RP</sub>

( / / ) = ( )

:

( / / ) = ( )  $L_{RP}$  :

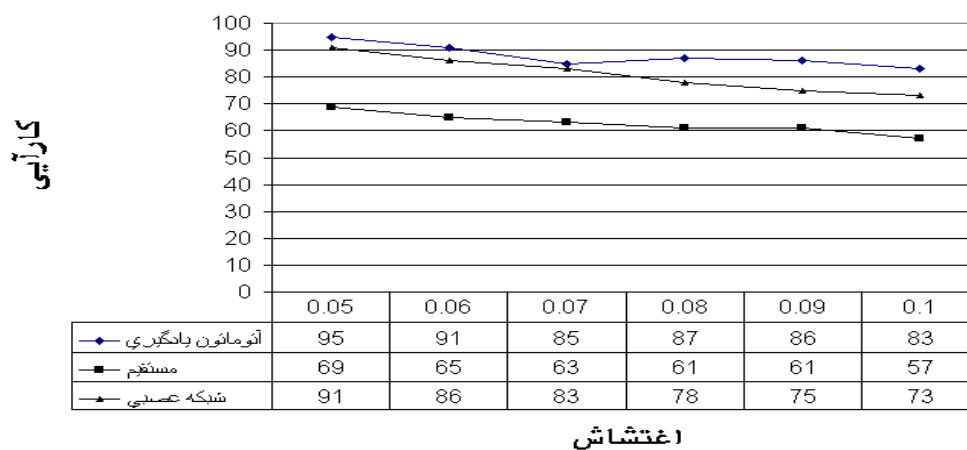
%	%	%	%	%	%	
%	%	%	%	%	%	

$L_{RP}$  :

/	/	/	/	/	/	
%	%	%	%	%	%	%
%	%	%	%	%	%	%

$L_{RI}$  ( / / ) = ( )  $L_{RP}$   $L_{RI}$   $L_{RP}$   $L_{RP}$   $L_{RP}$  :  
 $L_{RI}$   $L_{RI}$   $L_{RP}$

### مقایسه کارایی روشهای دریافت توپ



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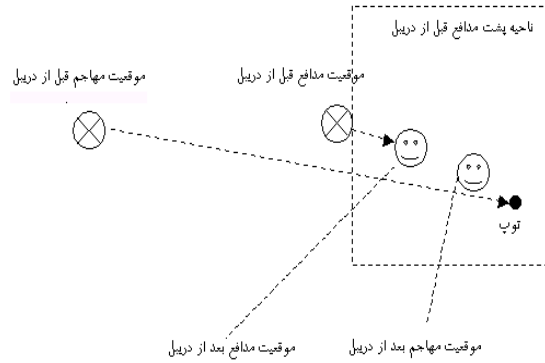
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(SoccerServer)



(kick pow dir)

(kick pow dir)

$L_{rp}$

( )

)

(



$R^2$   $L_{rp}$

$R^4$

( )

( )

		( )						
		( )				( )		
%	%	/ /		$L_{rp}$	%	/ /		$L_{rp}$
%	%	/ /		$L_{rp}$	%	/ /		$L_{rp}$
%	%	/ /		$L_{rp}$	%	/ /		$L_{rp}$
%	%	/ /		$L_{rp}$	%	/ /		$L_{rp}$
%	%	/ /		$L_{rp}$	%	/ /		$L_{rp}^*$
%	%	/ /		$L_{rp}$	%	/ /		$L_{rp}$
%	%	/ /		$L_{rp}$	%	/ /		$L_{rp}$
%	%	/		$L_{ri}$	%	/		$L_{ri}^*$
%	%	/		$L_{ri}$	%	/		$L_{ri}$
%	%	/		$L_{ri}$	%	/		$L_{ri}$

%  $L_{ri}$

$L_{ri}$

$L_{rp}$

$L_{rp}$

		( )						
		( )				( )		
%	%	/		$L_{ri}$	%	/		$L_{ri}$
%	%	/ /		$L_{rp}$	%	/ /		$L_{rp}^*$

%	%	%	%	

%	%	%	%	
%	%	%	%	

(kick power direction)

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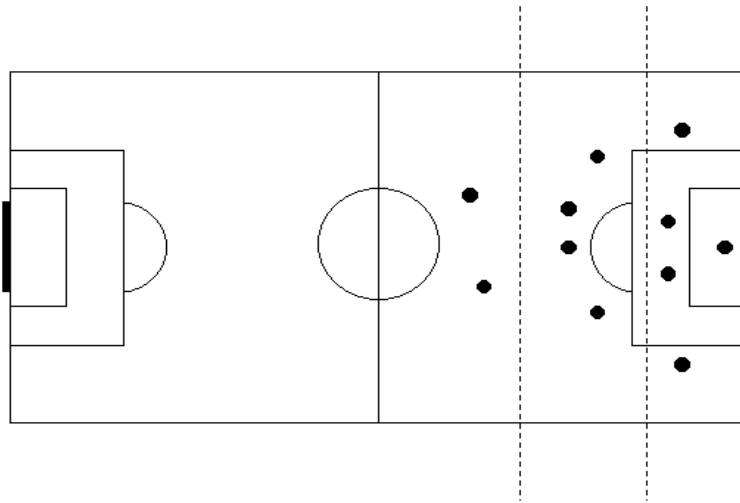
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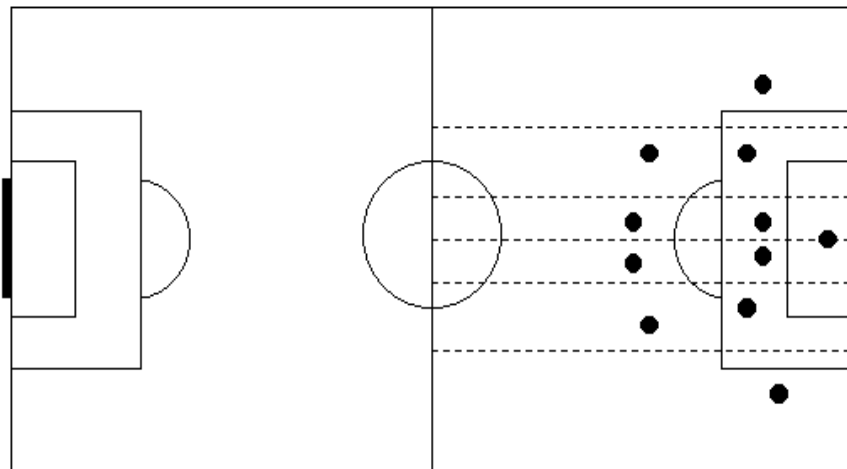
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L<sub>2N,2</sub> ,

$G_{2N,2}$ , Krinsky

N

$L_{2N,2}$

N

N

$G_{2N,2}$

$L_{2N,2}$

N

N

N

N

Krinsky

$G_{2N,2}$

$L_{2N,2}$

N

N

n

N

(  
 $L_{2N,2}$ , )

$N \leq 4$

$G_{2N,2}$ , Krinsky

$G_{2N,2}$

$L_{2N,2}$

Krinsky

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( % )

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