

pheromones). The algorithm goes ahead to next iteration until it reached the maximum iteration. The optimal path stored finally is the optimal path we aim at. The probability that ant  $k$  picks edge  $(i, j)$  in the  $T$  iteration is determined by (3).

$$P_{ij}^k(T) = \begin{cases} \frac{\tau_{ij}^\alpha(T) \eta_{ij}^\beta(T)}{\sum_{s \in allowed_k} \tau_{is}^\alpha(T) \eta_{is}^\beta(T)} & j \notin tabu \\ 0 & otherwise \end{cases} \quad (2)$$

Here, let  $\eta_{ij}$  be the visibility of edge  $(i, j)$ ;  $\tau_{ij}$  be trail degree of edge  $(i, j)$ ;  $P_{ijk}$  be transition probability of ant  $k$ ;  $\alpha$  be relative importance of trail ( $\alpha \geq 0$ );  $\beta$  be relative importance of visibility ( $\beta \geq 0$ ).