

## LIST OF NOTATIONS

Symbols	Definition
$V$	Vertex set $\{v_0, v_1, \dots, v_n\}$
$E$	Edge set $\{(v_i, v_j)   v_i, v_j \in V, i \neq j\}$
$v_i$	Vertex $i$ (hotel if $i = 0$ , POI if $i \geq 1$ )
$S$	User's desired hotel and POIs set
$D$	Travel day set
$Q$	Daily travel duration limit
$Q_0$	Departure time
$Q_1$	Time limit for returning to hotel
$o_i$	Opening hour of $v_i$
$c_i$	Closing hour of $v_i$
$N$	Maximum number of travel days
$t_{ij}$	Travel time from $v_i$ to $v_j$
$wt_i$	Waiting time at $v_i$
$s_i$	Time spent on $v_i$
$at_i$	Arrival time at $v_i$
$rating_i$	Rating of $v_i$
$cost_i$	Cost of $v_i$
$T$	Total travel duration
$T_d$	Travel duration on day $d$
$x_i$	Value of attribute $i$
$x_{i_{max}}$	Maximum value of attribute $i$
$x_{i_{min}}$	Minimum value of attribute $i$
$x_{i_{norm}}$	Normalized value of attribute $i$
$U(x)_{norm}$	Multi-Attribute Utility Theory (MAUT) value with the normalized attributes
$w_i$	Degree of interest (DOI) of attribute $i$
$q_0$	Probability parameter for transition rule in Ant Colony System (ACS)
$J_k(i)$	The subset of set $V$ that is still possible to be visited by ant $k$
$\tau_{ij}$	Pheromone concentration along the path from $v_i$ to $v_j$
$\eta_{ij}$	Heuristic value from $v_i$ to $v_j$ , equivalent to $U_j(x)_{norm}$
$U_j(x)_{norm}$	MAUT value for $v_j$ considering attributes such as the cost and rating of $v_j$ , along with the travel time from $v_i$ to $v_j$
$\alpha t$	Relative influence of $\tau_{ij}$
$\beta$	Relative influence of $\eta_{ij}$

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Symbols	Definition
$\rho$	Pheromone evaporation rate within the range of [0,1] for local pheromone update
$U(x)_{norm_k}$	Fitness value by ant $k$
$\alpha$	Pheromone evaporation rate for global pheromone update
$U(x)_{norm_{best}}$	Fitness value for the best solution