

Notation	Definition
D	a given data set of spatio-temporal data
o	a spatio-temporal object
x_i	the longitude of a spatio-temporal data
y_i	the latitude of a spatio-temporal data
t_i	the timestamp of a spatio-temporal data
h_n	the value of Morton order in Hilbert curve
L	the deepest level of HOC-Tree
ψ	the division threshold value for a node in HOC-Tree
v	the Morton order of a leaf node in HOC-Tree
q	a spatio-temporal range search $([x_{min}, x_{max}], [y_{min}, y_{max}], [t_{start}, t_{end}])$
d	the Euclidean distance between two points in spatial space