Abstract

One of the key issue in the development of spatial database is that how efficiently the spatial query is handled, because of processing spatial queries requires a higher computational cost compared to standard relational database queries. Because spatial data tend to be dynamic, large, and complex, an efficient index structure required to improve the performance of spatial queries.

R-Tree (Rectangle Tree) is a dynamic index structure used for efficiency in the retrieval of spatial database objects according to their spatial location. R-tree is a further development of the B^+-Tree for indexing spatial objects which are both high-balanced trees, where leaf nodes will be at the same level.

Previous research claims that the order of insertion and deletion can affect the differences form of R-tree index structure. This final project will prove whether the differences form in R-tree index structure made by the different ordering of insertion and deletion may affect the performance of the R-tree. Experiments were done using the spatial query "range serach" at each different insertion and deletion ordering scheme.

The test results show that the sequence of objects that related to their spatial locations are shown to produce better performance in terms of minimal overlap produced more than the order of objects that are not related to the spatial location moreover the variation of the distribution of spatial data will affect the performance of R-tree. The distribution of data with very high dense will tend to produce better performance on constructing R-tree index, but produce poor performance on the range search as compared with dataset which object distribution is more sparse.

Keywords: *R-Tree, spatial, indexing, order, insertion, deletion, query, performance*