Abstract

Finding the polygon hull in a connected Euclidean graph can be considered as the problem of finding the convex hull with the exception that at any iteration a vertex can be chosen only if it is connected to the vertex chosen at the previous iteration. One of the methods that can be used for this kind of problems is Jarvis' algorithm which allows to find the convex hull and which must be adapted because it does not take into account the connections of the nodes. In this paper, we propose a new algorithm that chooses for a current node and among its neighbors in the graph the nearest polar angle node with respect to the node found in the previous iteration. Its complexity is $O(gh^2)$, where g is the maximum degree of the graph and h the number of the nodes on the hull. For ease of presentation, we first identify some specific graph-structures whose presence may lead a basic version of the algorithm to fail, and we then show how to modify that version to obtain a procedure of the given complexity. Finally, we present some practical applications that can be resolved using the proposed algorithm.