

Algorithm *Modified-Nearest*($x_{rand}, V(G), ||\cdot||_J$)

(* Finds a point nearest to given point in the graph with respect to the value function *)

1. $X_{near} \leftarrow$ subset of vertices in $V(G)$ such that $x_{near} = \arg \max_{x \in V(G)} (||x - x_{rand}||)$
2. return $x_{near} \in X_{near}$ that is closest to the goal when compared using euclidean distance
3. End of Algorithm

$||x - y||_J = J(x) - J(y)$ where $x, y \in S$.