Homework 6

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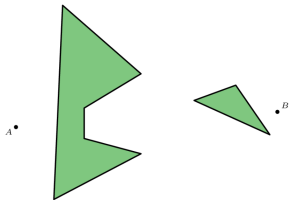
1 Question 1

A robot wants to follow the shortest path from A to B, avoiding the obstacles below.

1. Draw the visibility graph on the diagram. Be sure to include all of the edges.



2. Find one of the edges in the visibility graph that is NOT part of the reduced visibility graph. Mark this edge with a $\star$.

1.1 Solution

1.1.1 Draw the visibility graph

Figure 1 shows the visibility graph, which includes all edges where any two vertices are visible to each other without obstruction. The graph consists of 11 vertices and 28 edges.

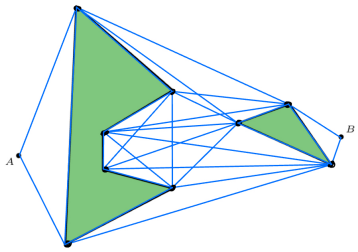


Figure 1: Visibility Graph

1.1.2 Find one of the edges in the visibility graph that is NOT part of the reduced visibility graph

Figure 2 shows an edge that should not be included in the reduced visibility graph. As indicated by the orange line, if we extend the edge, it intersects the obstacle on the left. Therefore, this edge can be removed.

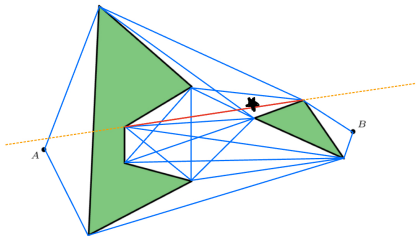


Figure 2: The edge in red and highlighted with $\star$ is one of the edges that should not be included in the reduced visibility graph.