Solution.

Pick a random vertex $v \in V$. Since the graph is bridgeless and connected, v must have a degree of at least 2 (as a degree of 1 would imply there exists a bridge). Start a DFS from v, and as you traverse each edge for the first time, direct it away from the current vertex. When you reach a new vertex, apply the same process to all of its undirected edges. Continue this DFS process until all edges have been directed. Each vertex we reach will be reachable from v, and since the graph is bridgeless, there must also be a way to return to v from all other vertices. Therefore, every vertex is reachable from every other vertex, ensuring a strong orientation of the graph. This algorithm runs in $O(|E|)$ time since each edge is consered at most twice: once when it is directed during the DFS traversal, and possibly once more if it is part of a backtracking step.