Intersection of lines

October 20, 2018

Abstract

This document outlines a method for determining whether the intersection of two lines falls within a circle.

1 Setup

Consider two lines each defined by two points on a circle, P_1 and P_2 and Q_1 and Q_2.

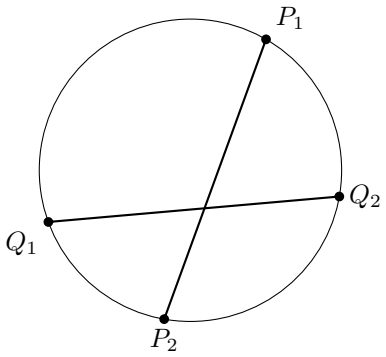

Figure 1: Two lines

These lines can obviously intersect or not. This intersection can be checked without reference to the lines, but by simply looking at the angles of the points.

If P_1 and P_2 are "next to" each other, that is, there i no point between them, then they do not intersect any point. On the other hand, if there is a point between them, but not that points counterpart, then that point's line will intersect it.

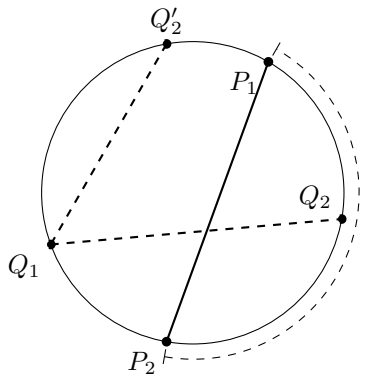

Figure 2: Intersecting vs. Non-intersecting lines

We can see that the line $\overline{Q_1Q_2}$ intersects $\overline{P_1P_2}$, while $\overline{Q_1Q_2'}$ does not. In cact, any placement of Q_2 within the dashed interval will result in an intersection, while any outside will not. This, in order to check fot intersection, it is sufficient to check the sequence of angles.

2 Method

TODO