Wall Hugger and G143

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Outline

1. Wall Hugger
2. G143
3. Psuedo Oracle
4. Side points
5. Loop Shortening
Figure: One realization of the WallHug algorithm. Oracle calls: 689, Path length: 2.37
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Realisation

This algorithm extends from Test Algorithm 2; ensuring path feasibility, changing our step size and removing loops.

Figure: An example path found with $n = 400$ and $r = 0.05$. 
Left Figure: \( \Delta(ABC) = \frac{1}{2} BC \sin(a) \).

Right Figure: \( 2r = \frac{A}{\sin(a)} \).

Find the radius: \( r = \frac{ABC}{4 \Delta(ABC)} \).
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Psuedo Oracle

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Side points

- Line segment has length $2r$
- We want every point within $r$ of the line segment to be within $r$ of a miss
- Test $n$ points each side of line
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Place points at distance $r - y$ from path segment.

\[ r^2 = y^2 + \frac{r^2}{n^2} \]
\[ y^2 = r^2 \left(1 - \frac{1}{n^2}\right) \]
\[ y = r\sqrt{1 - \frac{1}{n^2}} \]
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