

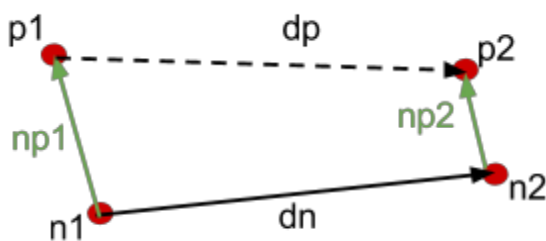
Computing distance from RootGraph (G) to RootAxialTree (T):

1. compute distance from all G nodes to all T segments

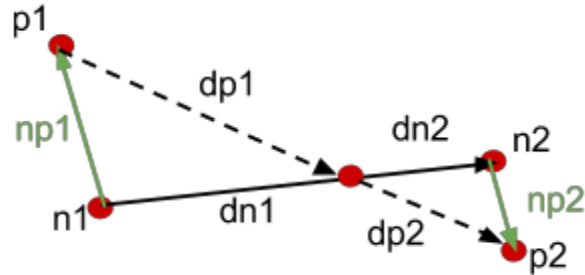
- All nodes are projected on all segments,
- For all T axes, for all nodes, find the segment where the node to its projection has minimum norm (i.e. min distance)
- return (for all node and all axe), the distance, the segment id, and the node projection

2. Approximate area between G segment to T axe:

- The area is approximated by the area of the quad constructed such that the G segment is one side, and its projection (obtained from (1)) is the opposite side.
- To compute this area, two cases needs to be treated:



normal case



crossed case

normal case:

$$\text{Area} = (|dn \otimes np1| + |-dp \otimes np2|) / 2$$

note: there is a case where this is wrong (concave quad with concavity in $n1$)

crossed case:

$$\text{Area} = (|dn1 \otimes np1| + |dp2 \otimes np2|) / 2$$