L0

L1

Ln

v0

v1

v2

v3

(\*\*\* this is not right – we don’t know the target locations of {L0, L1, …, Ln}, we just know that we want them to be on a line

Given: Target locations of {L0, L1, … , Ln-1} at proportions {p0, p1, … , pn-1} along lines {v0v1, v1v2, … , vn-1vn} respectively.

Find: locations of {v0, v1, … , vn}

such that:

⭭

This system is underspecified. One way to fully specify it is as follows:

1. If n is even, we can specify the location of vn/2 (i.e. move it by the weighted average of the movement of L(n/2)-1 and Ln/2), then solve the remaining equations
2. If n is odd, we can constrain the system such that the movement of v(n-1)/2 and v(n+1)/2 must be equal.

Algorithm: Straighten Line

Input: two end points E1 and E2 (on either source map or cartogram)

1. If end points specified on cartogram, {E1,E2} ⭠ translate to source map {E1,E2}
2. xEdgeIDs ⭠ ids of n-1 edges crossed by line {E1,E2} on source map
3. p