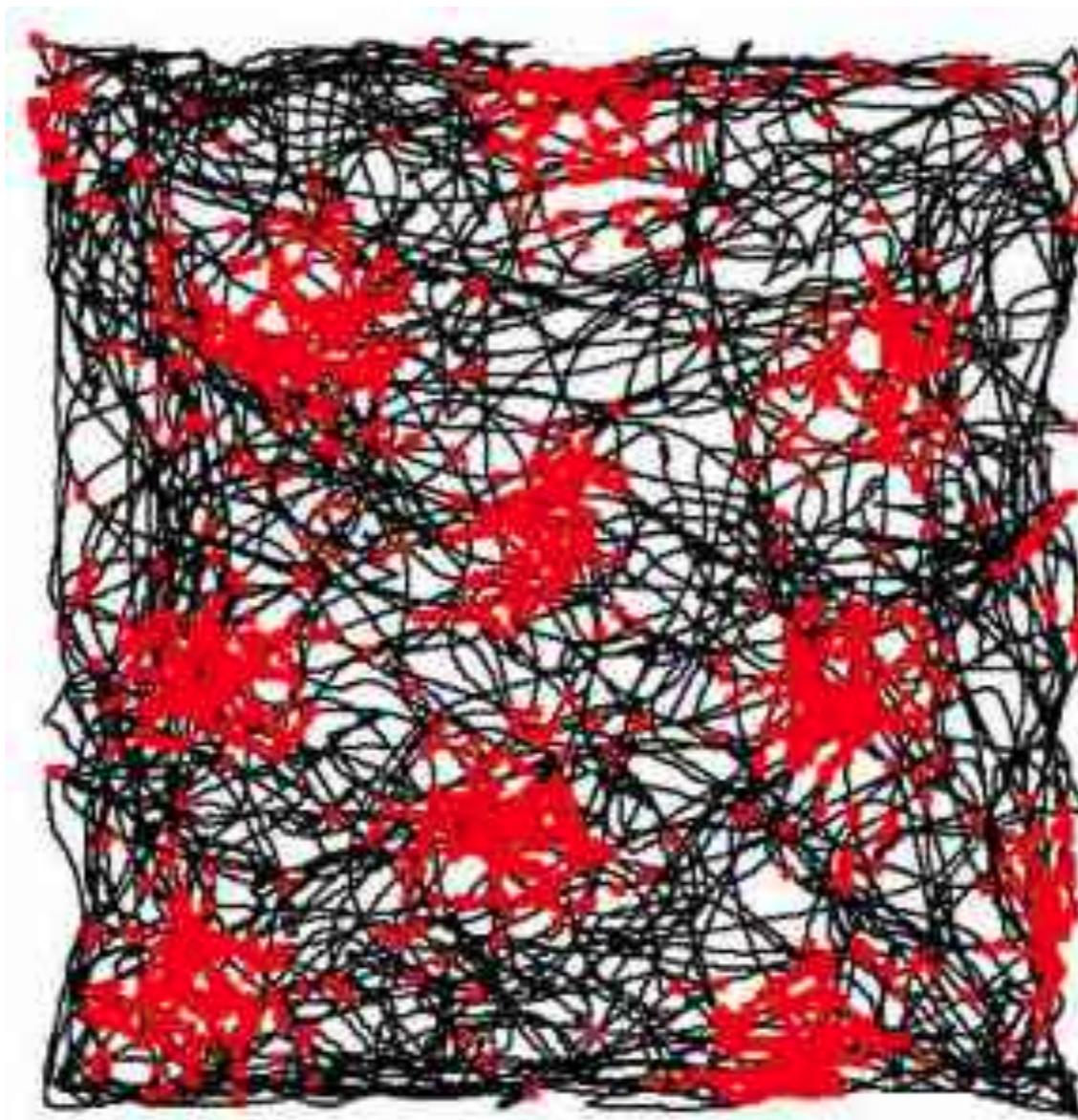
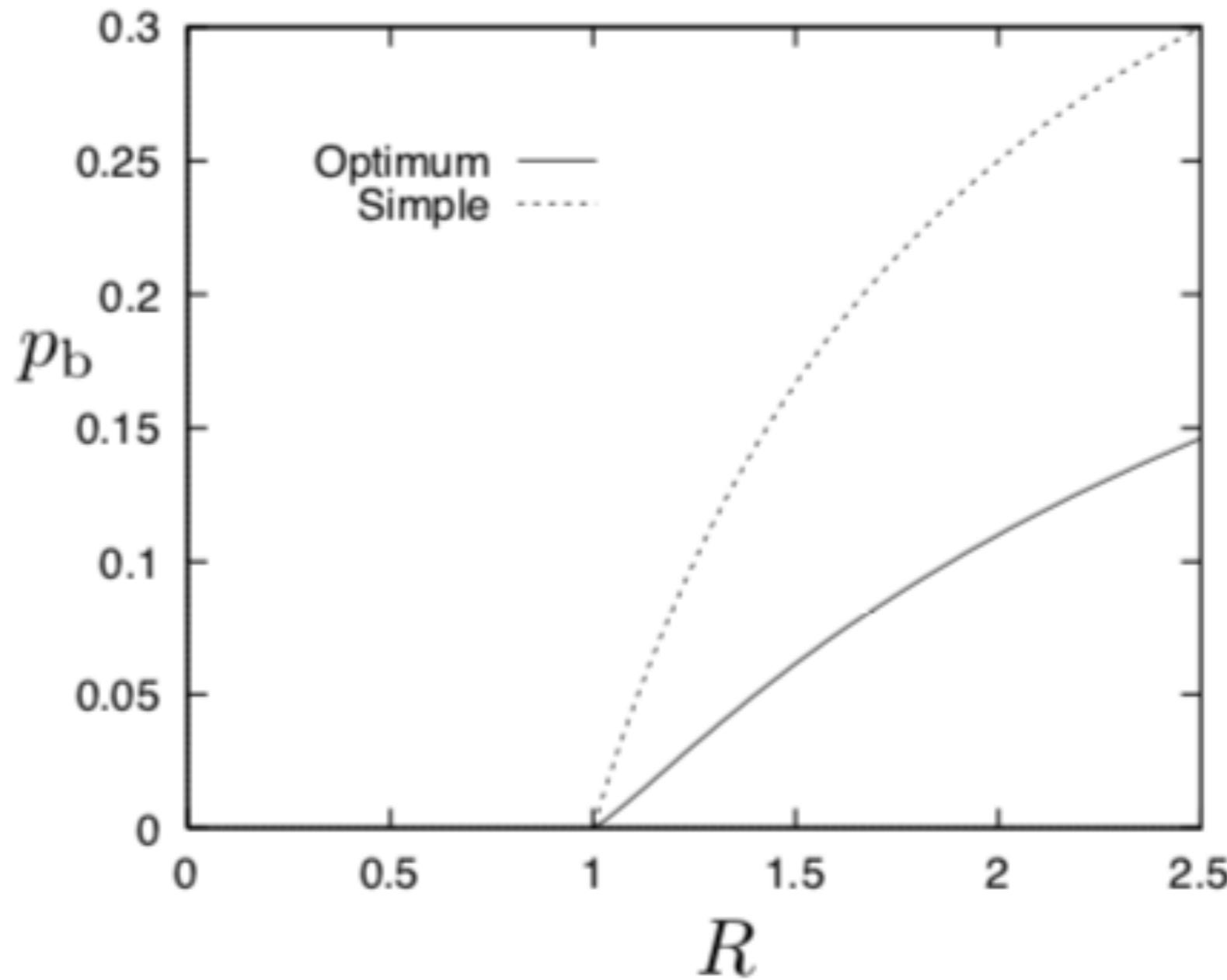


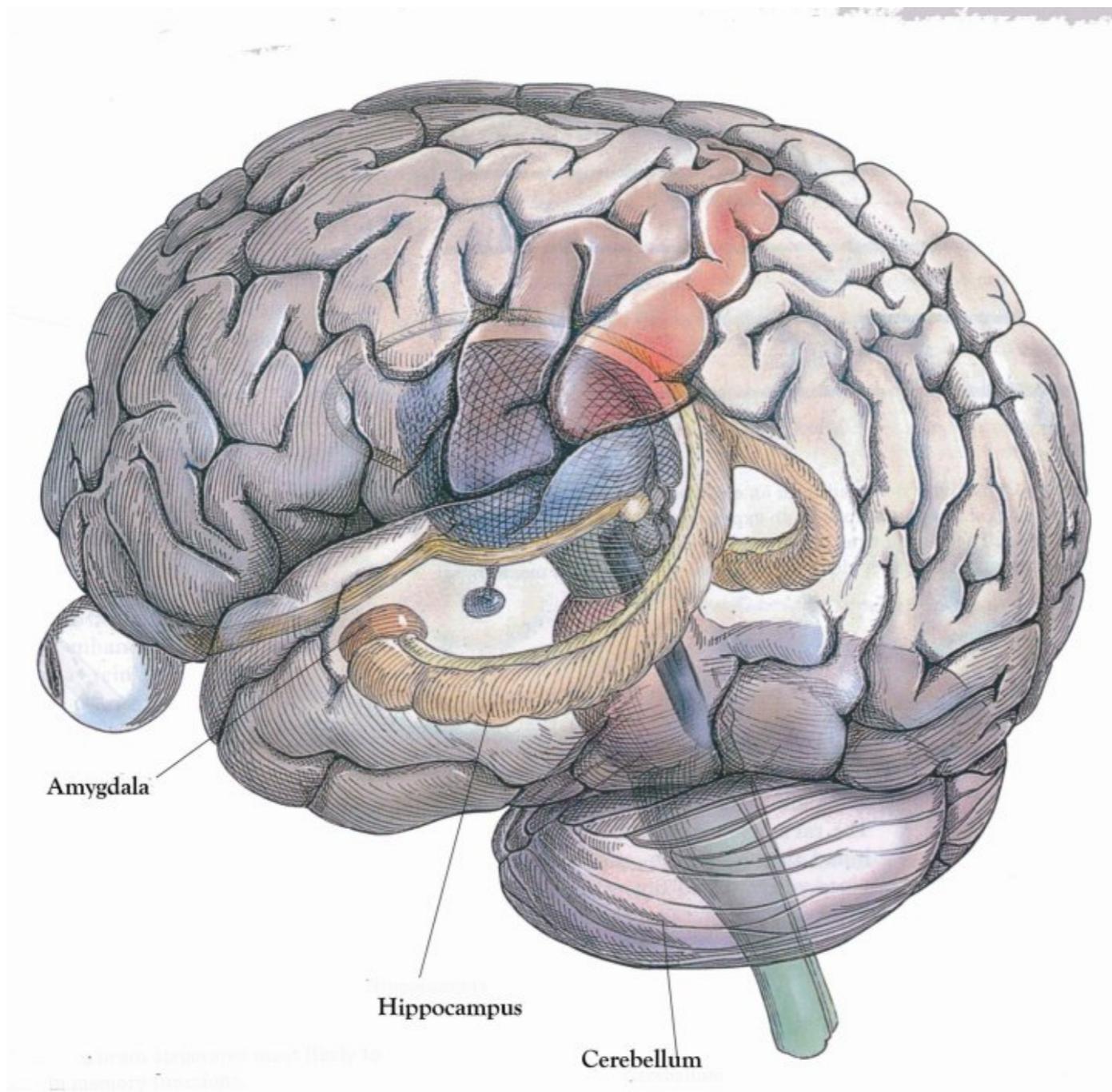
Lecture 16: *Grid cells, place cells and good decoders*



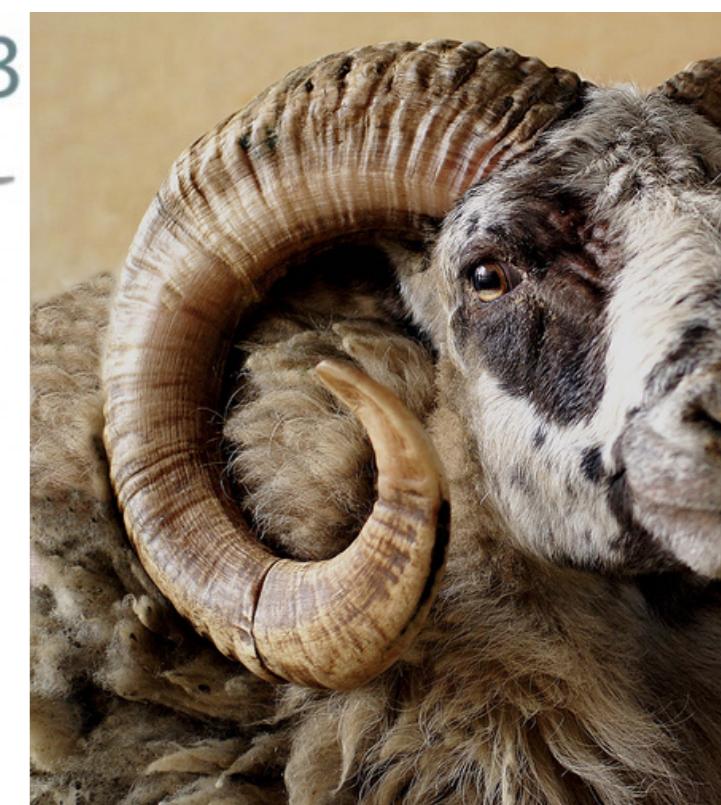
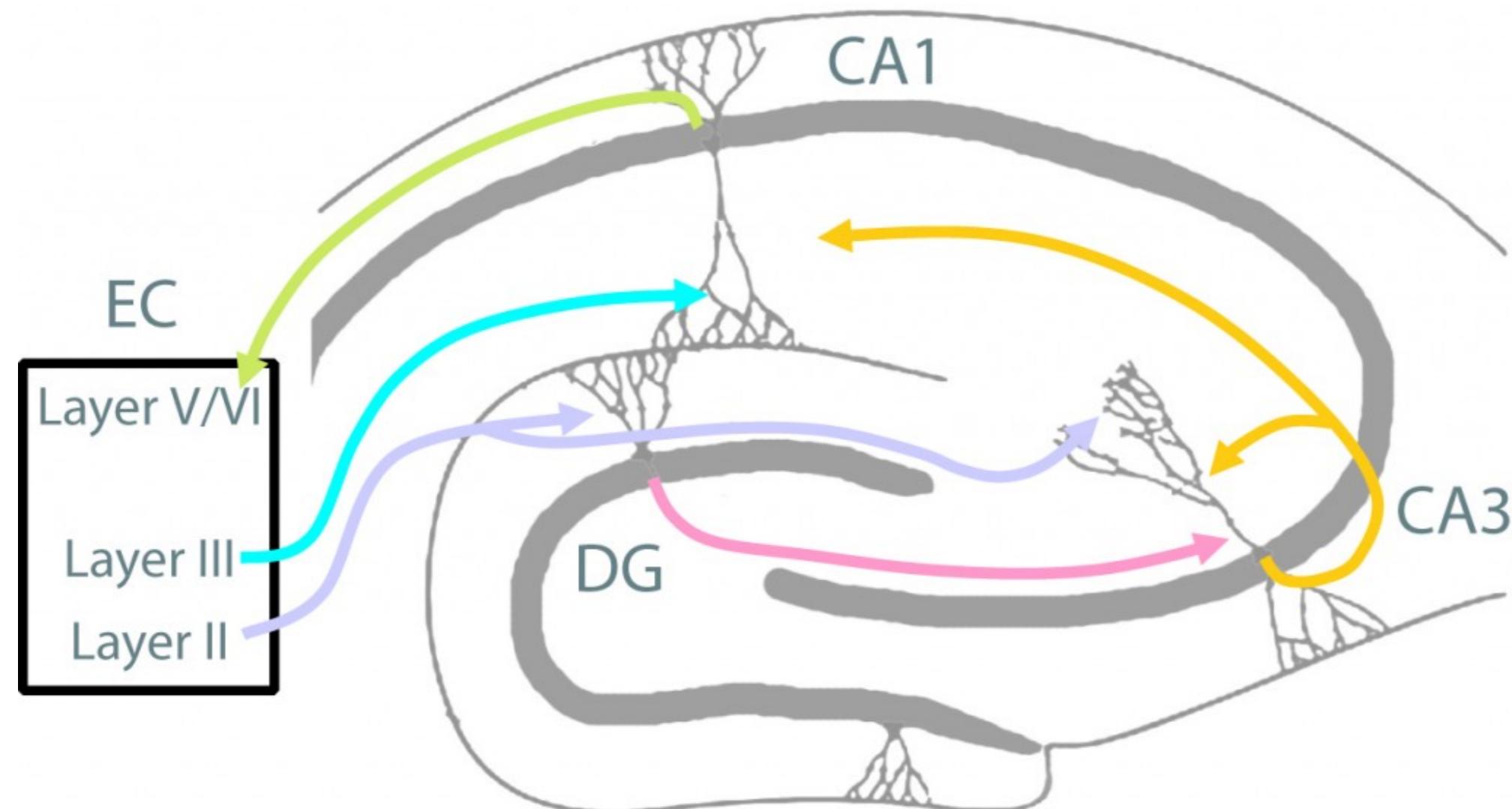
Recall our introduction to channel coding:



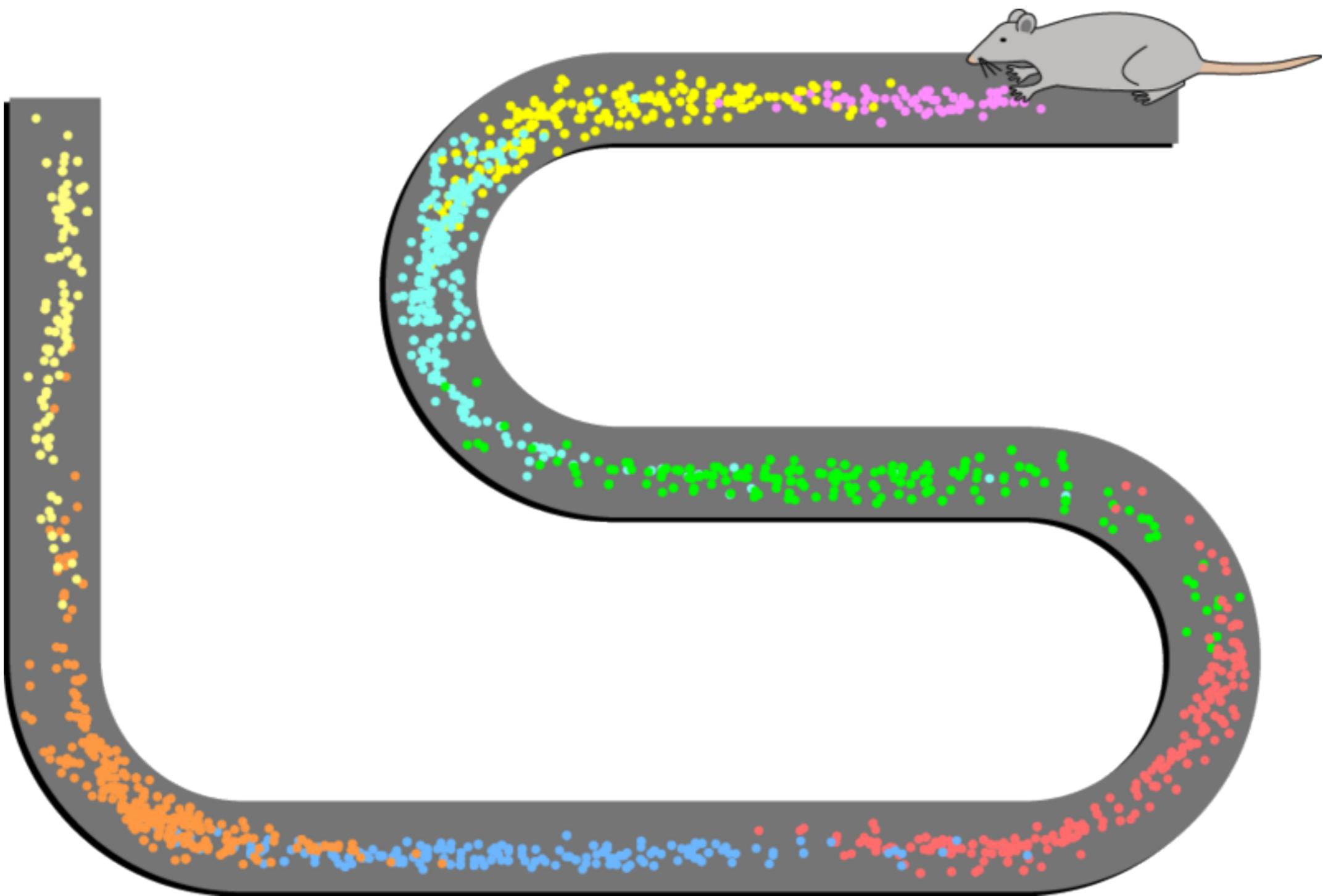
The hippocampus:



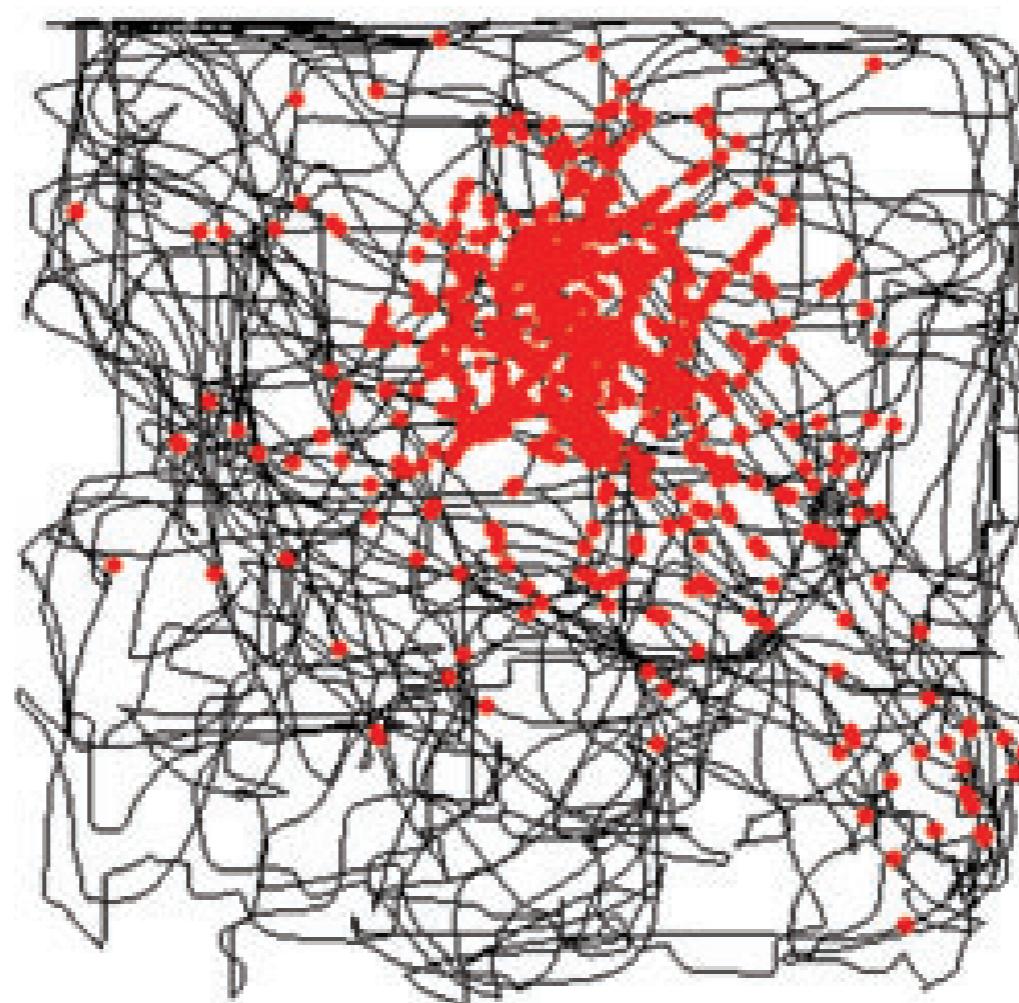
Regions within the hippocampus:



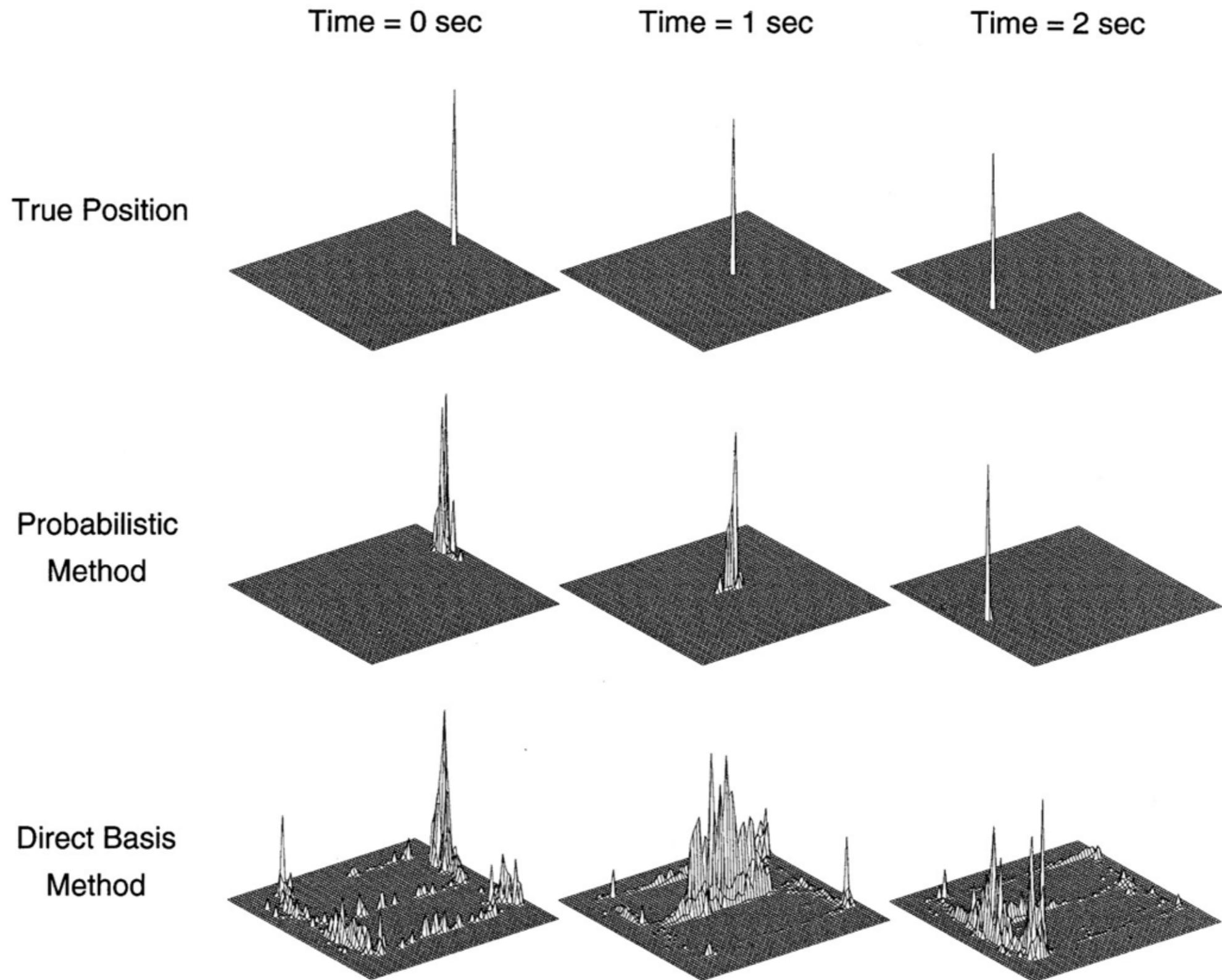
Place fields in the hippocampus:



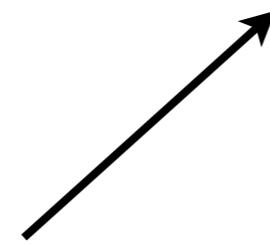
Place fields in test enclosures:



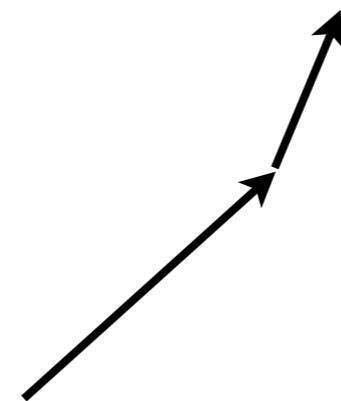
Decoding position from place cell activity:



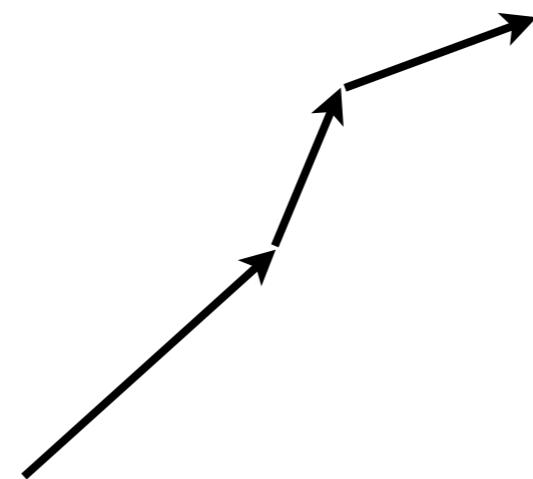
Errors accumulate during path integration:



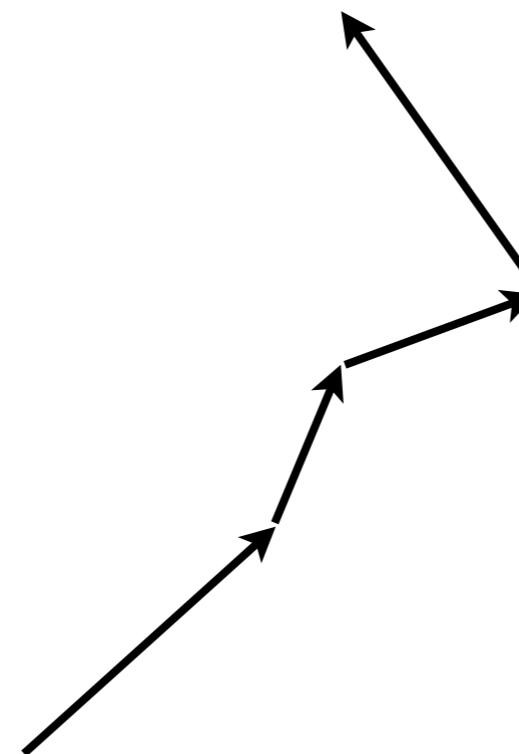
Errors accumulate during path integration:



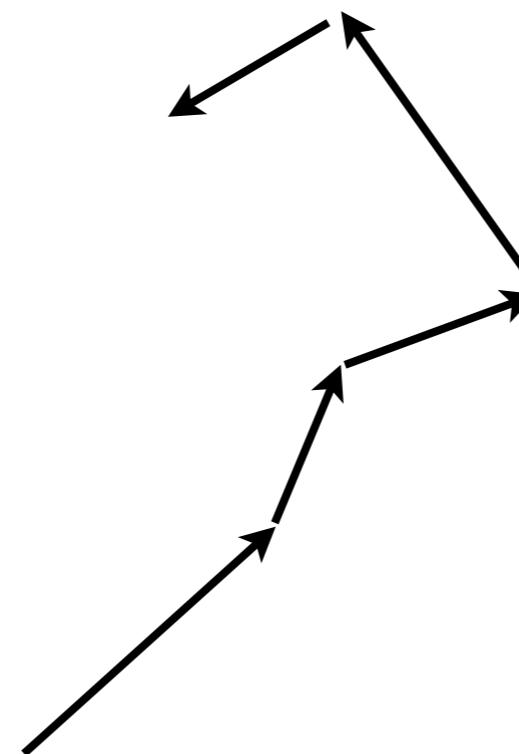
Errors accumulate during path integration:



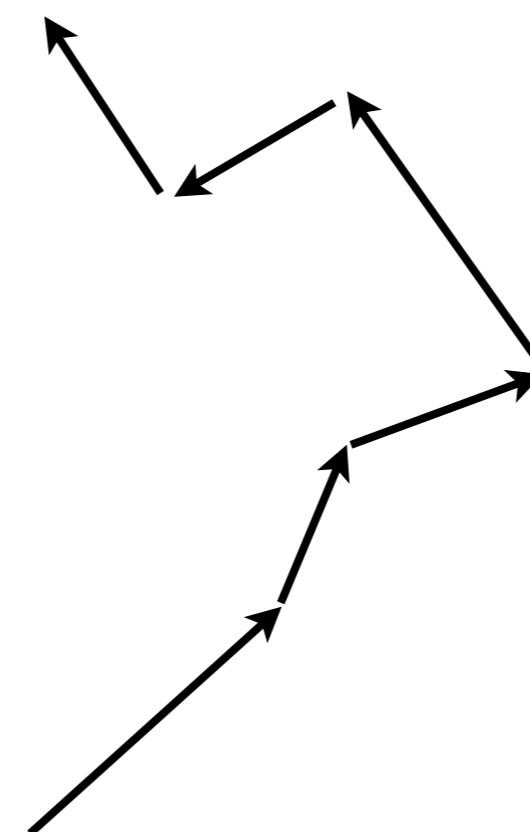
Errors accumulate during path integration:



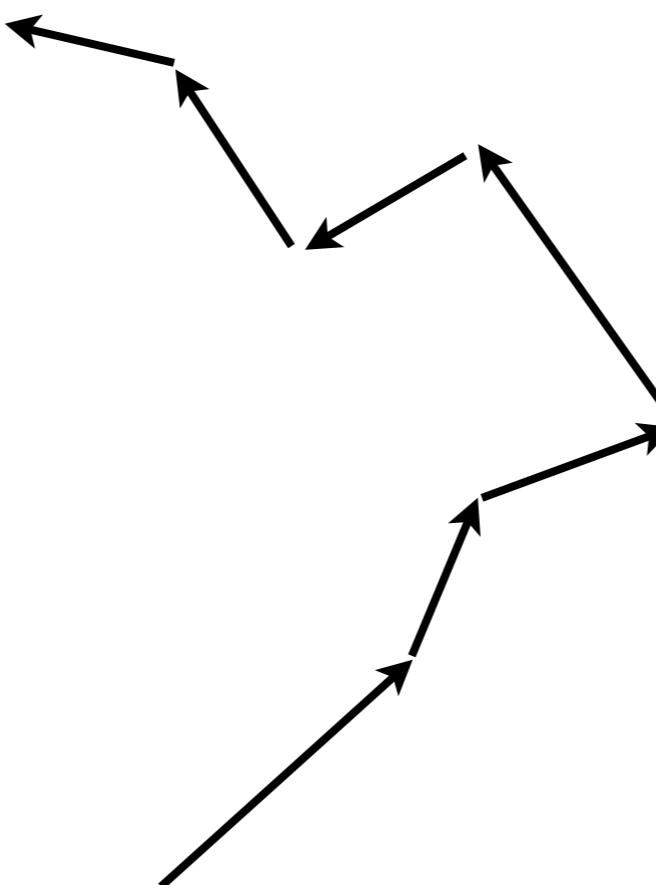
Errors accumulate during path integration:



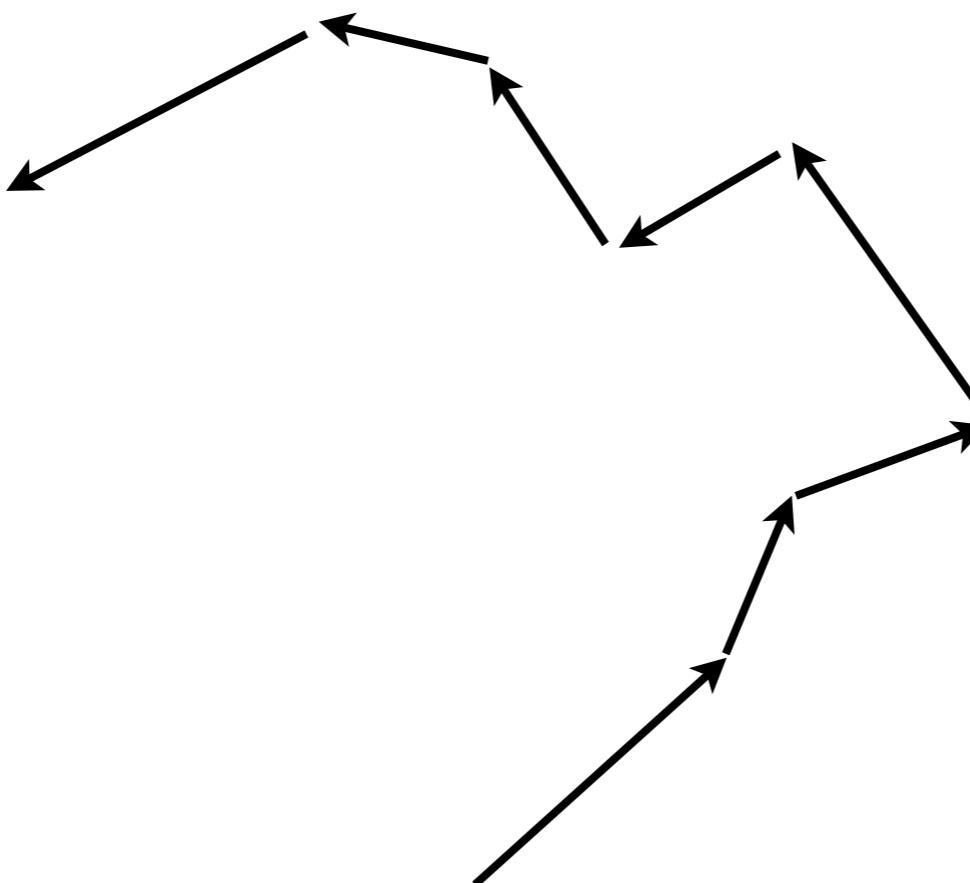
Errors accumulate during path integration:



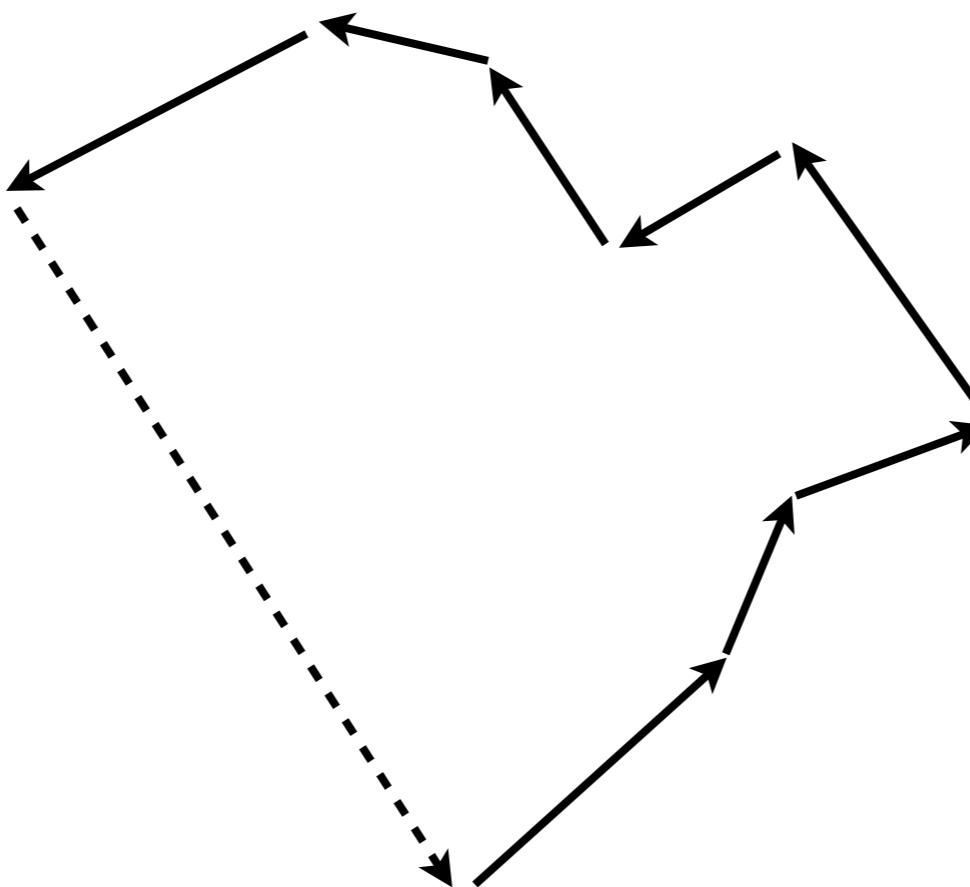
Errors accumulate during path integration:



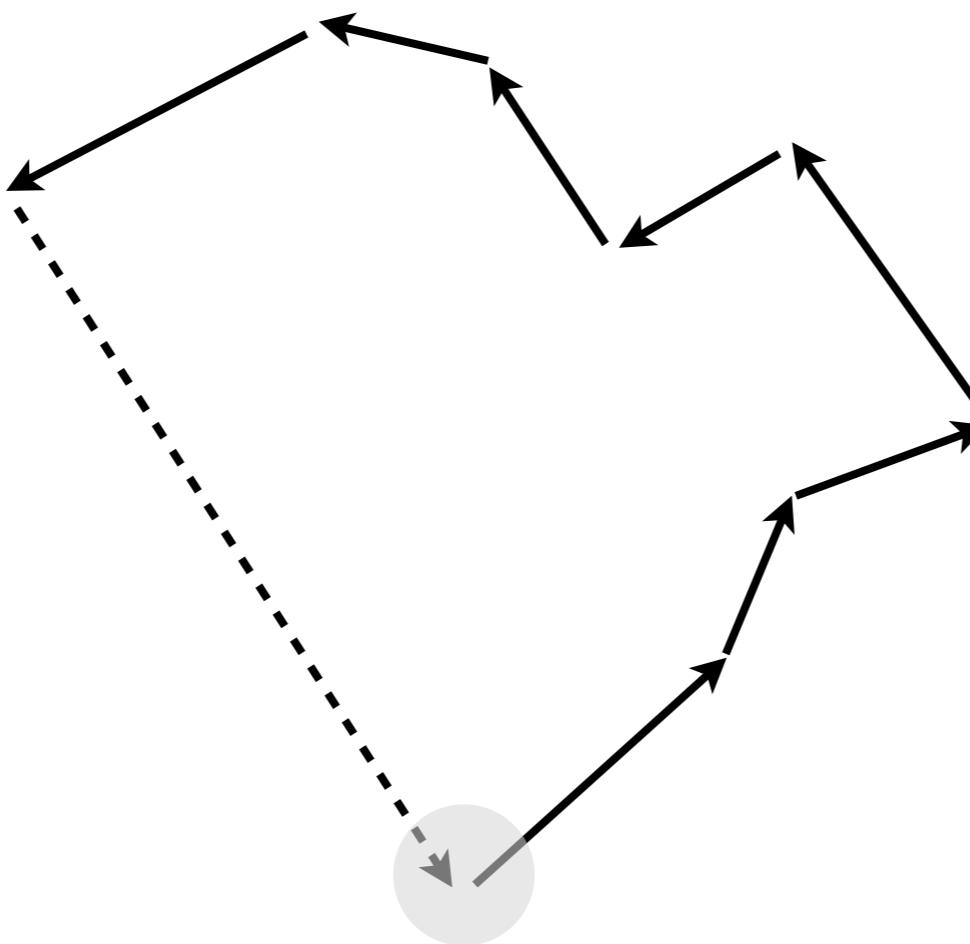
Errors accumulate during path integration:



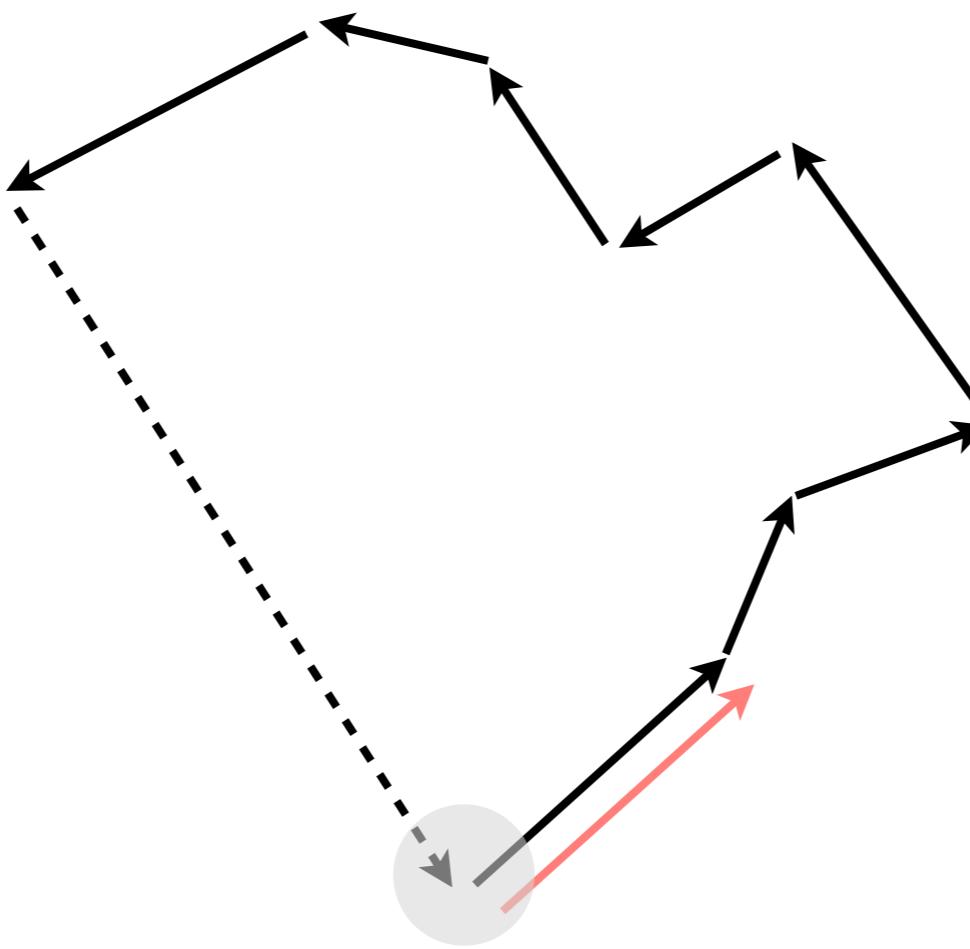
Errors accumulate during path integration:



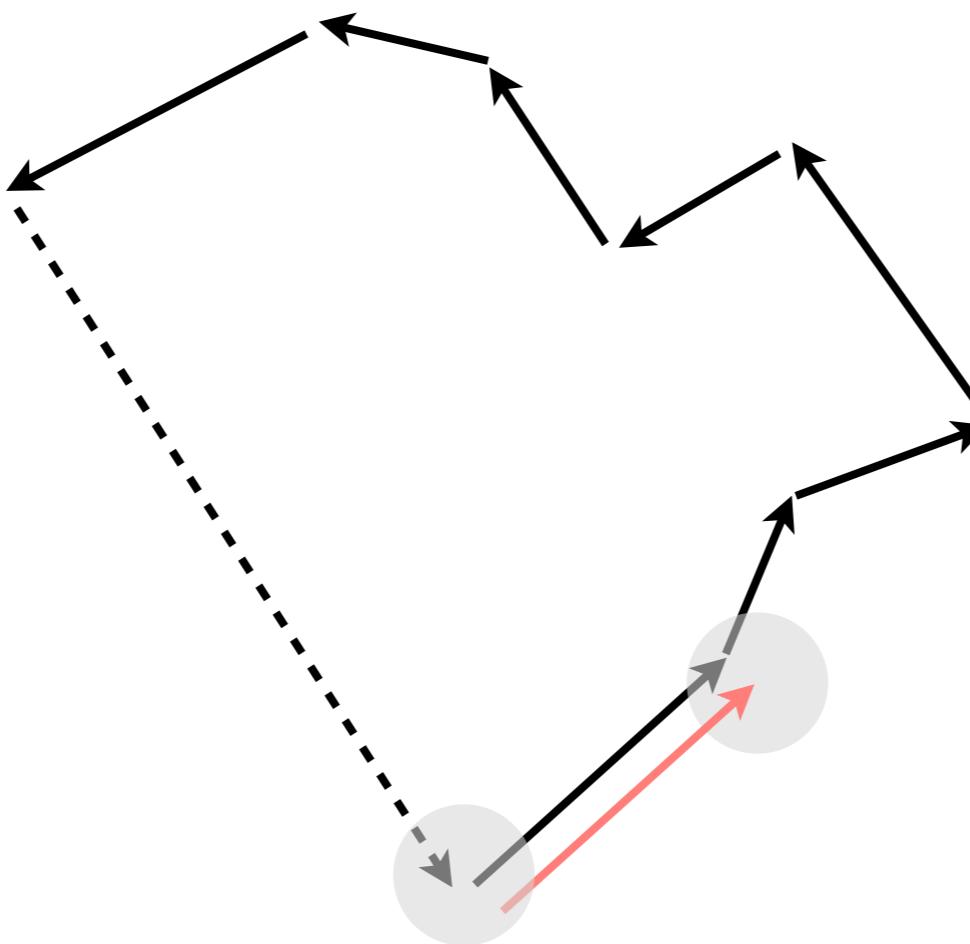
Errors accumulate during path integration:



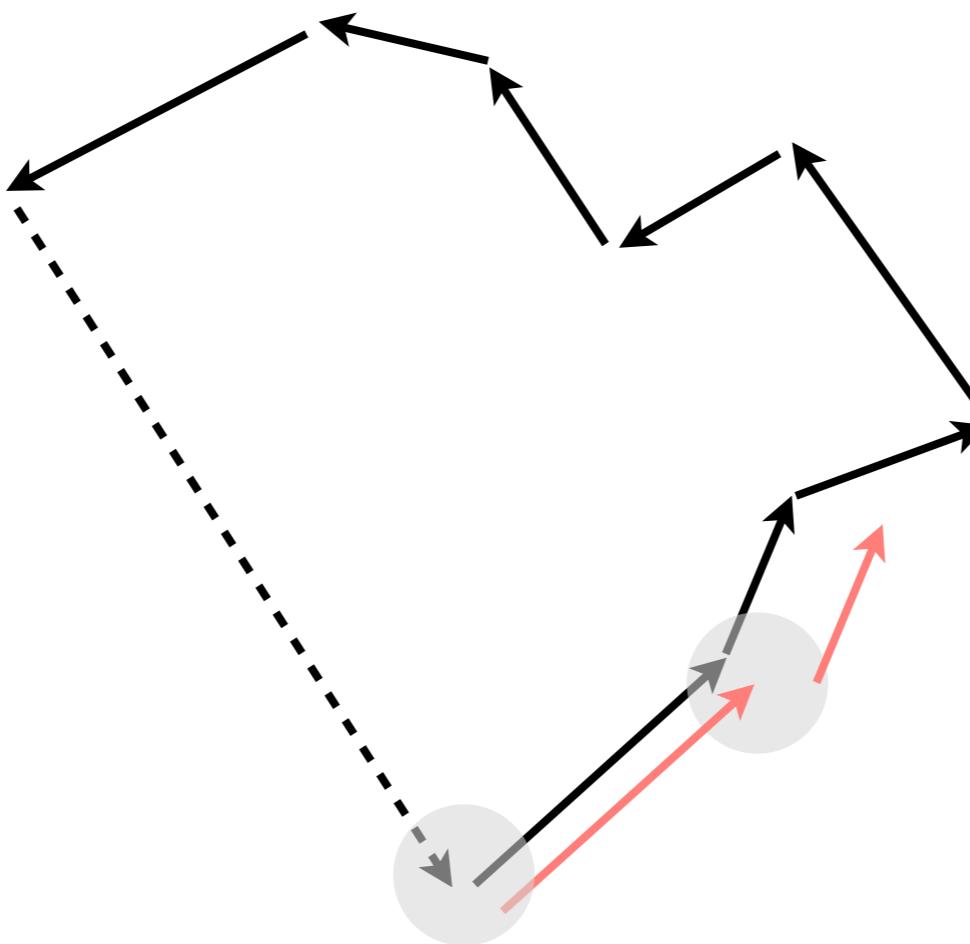
Errors accumulate during path integration:



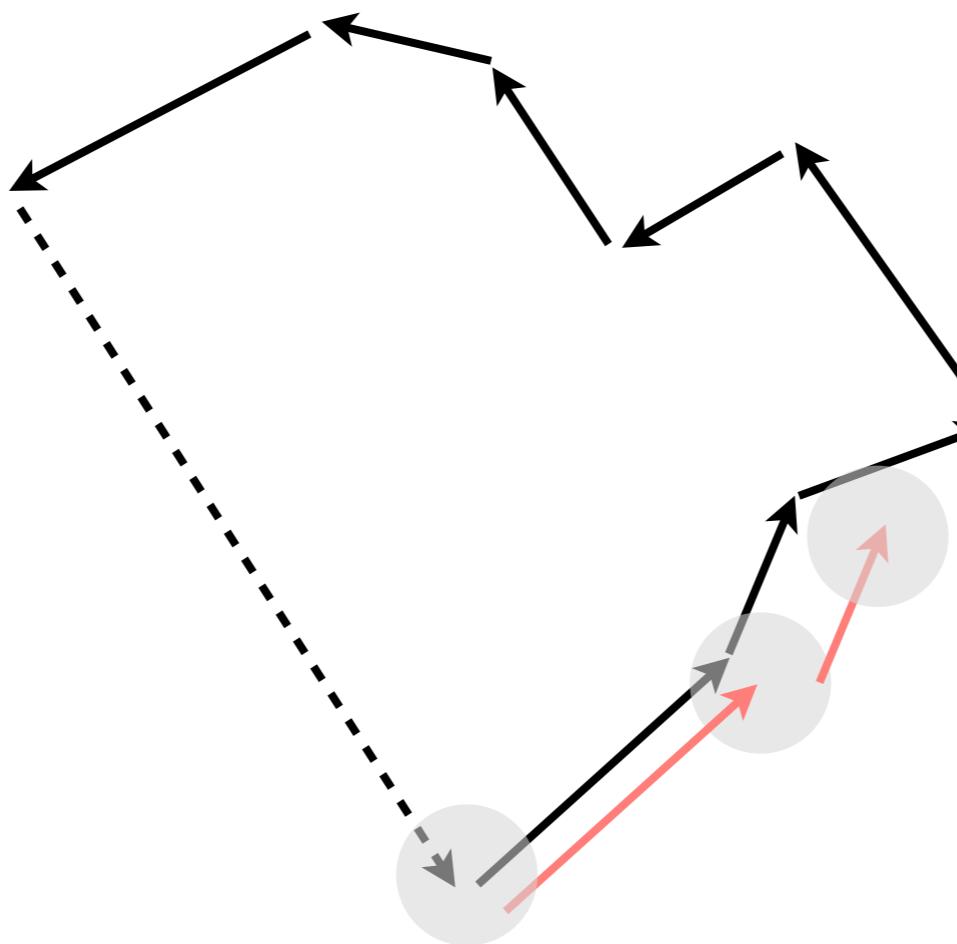
Errors accumulate during path integration:



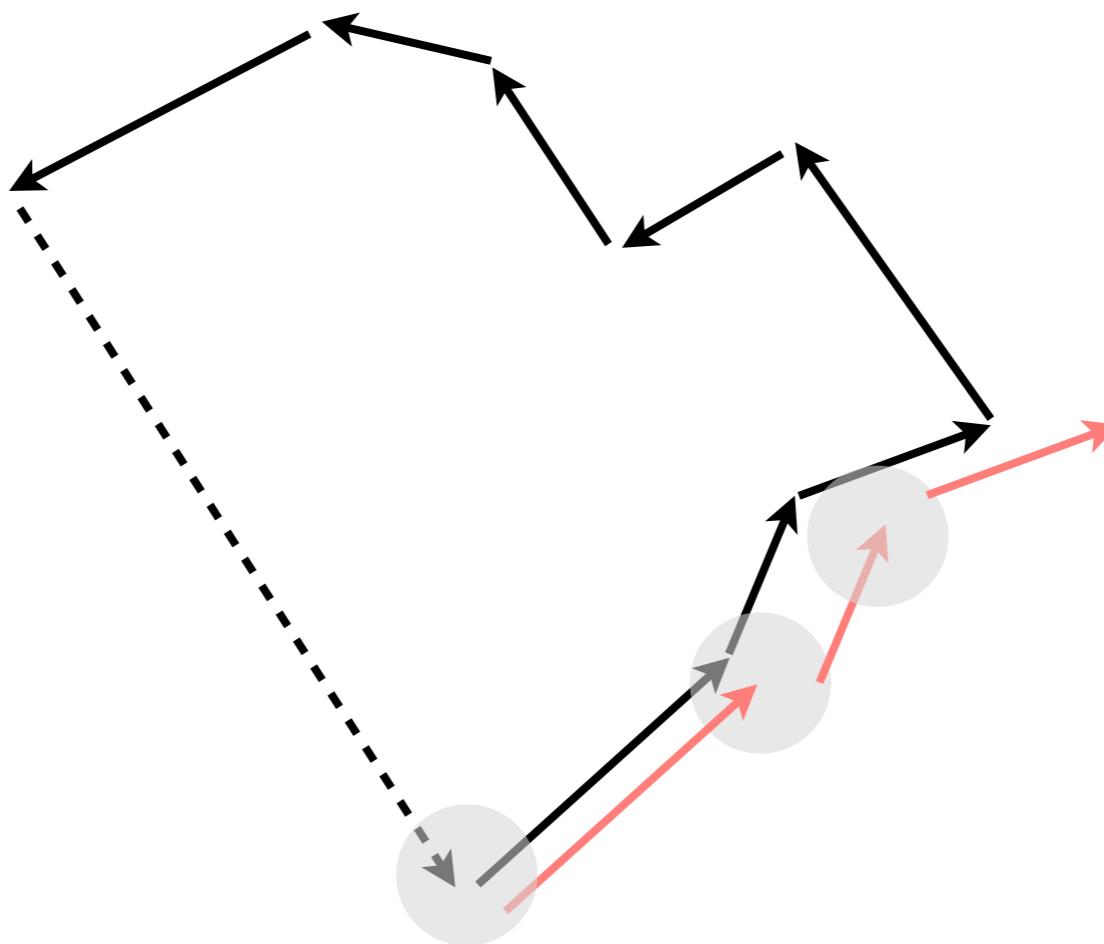
Errors accumulate during path integration:



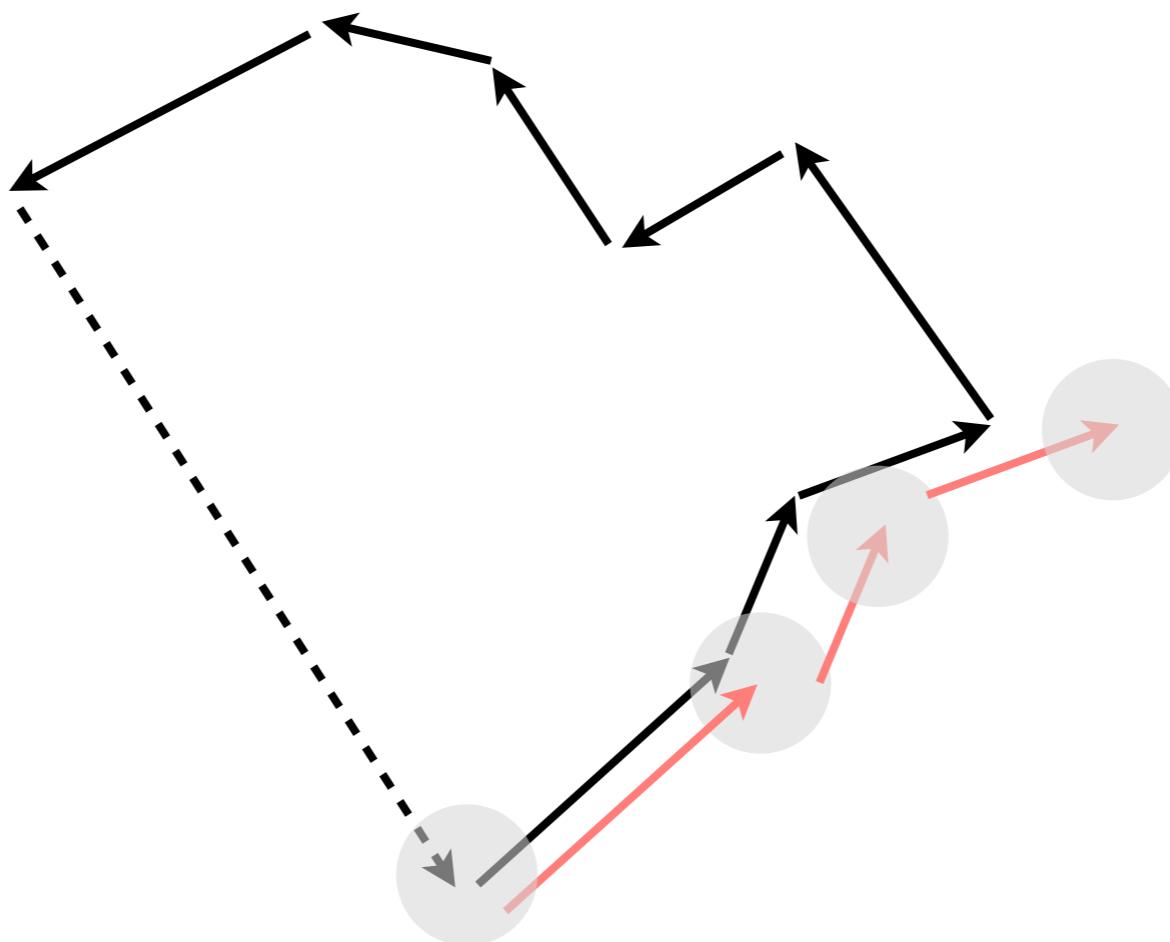
Errors accumulate during path integration:



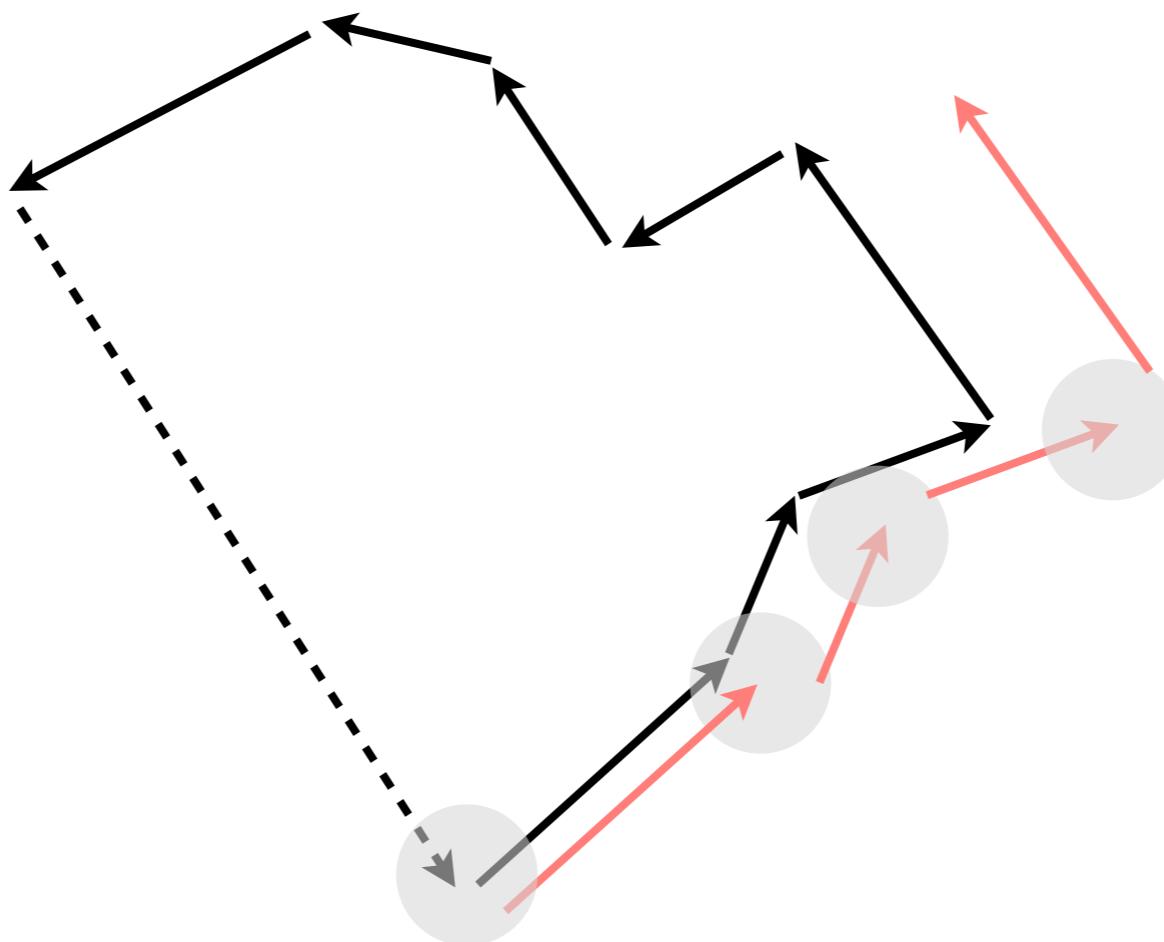
Errors accumulate during path integration:



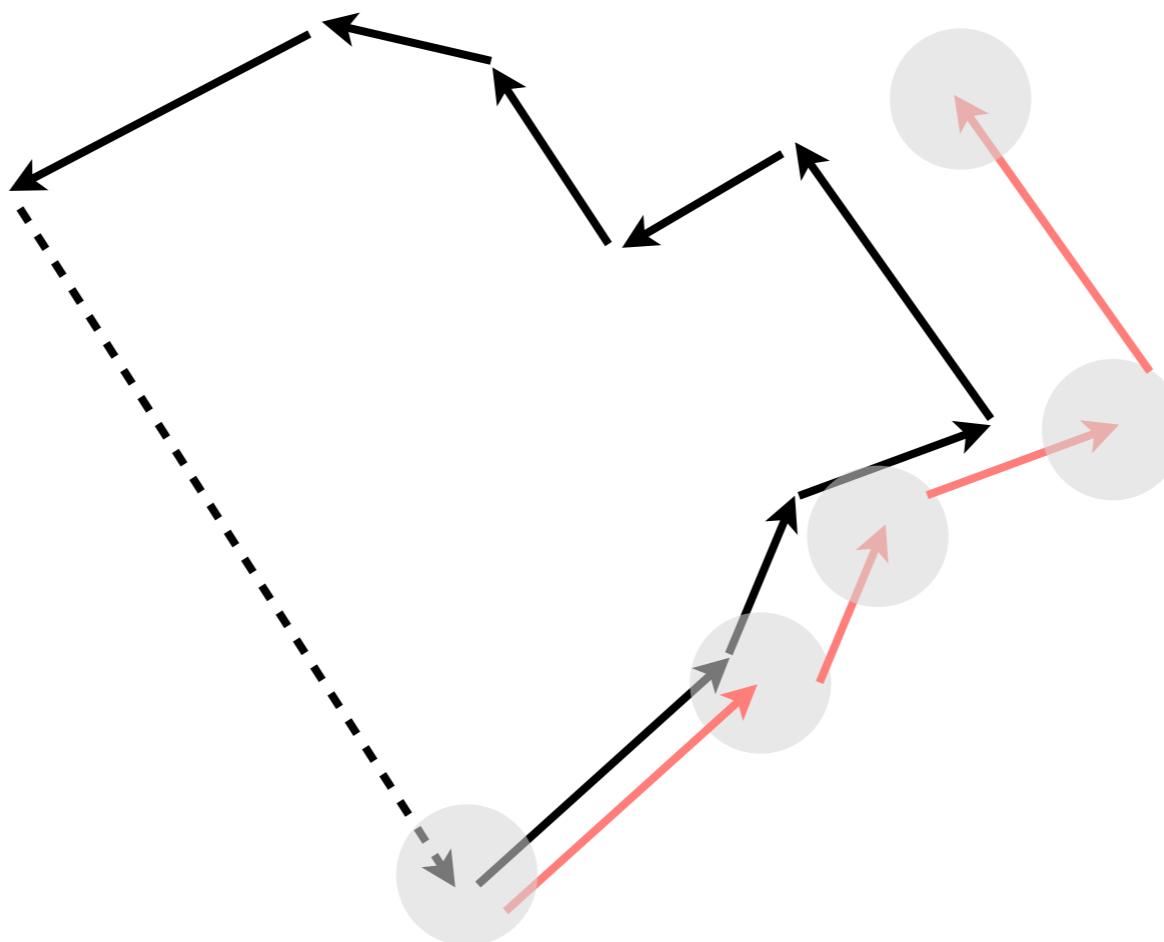
Errors accumulate during path integration:



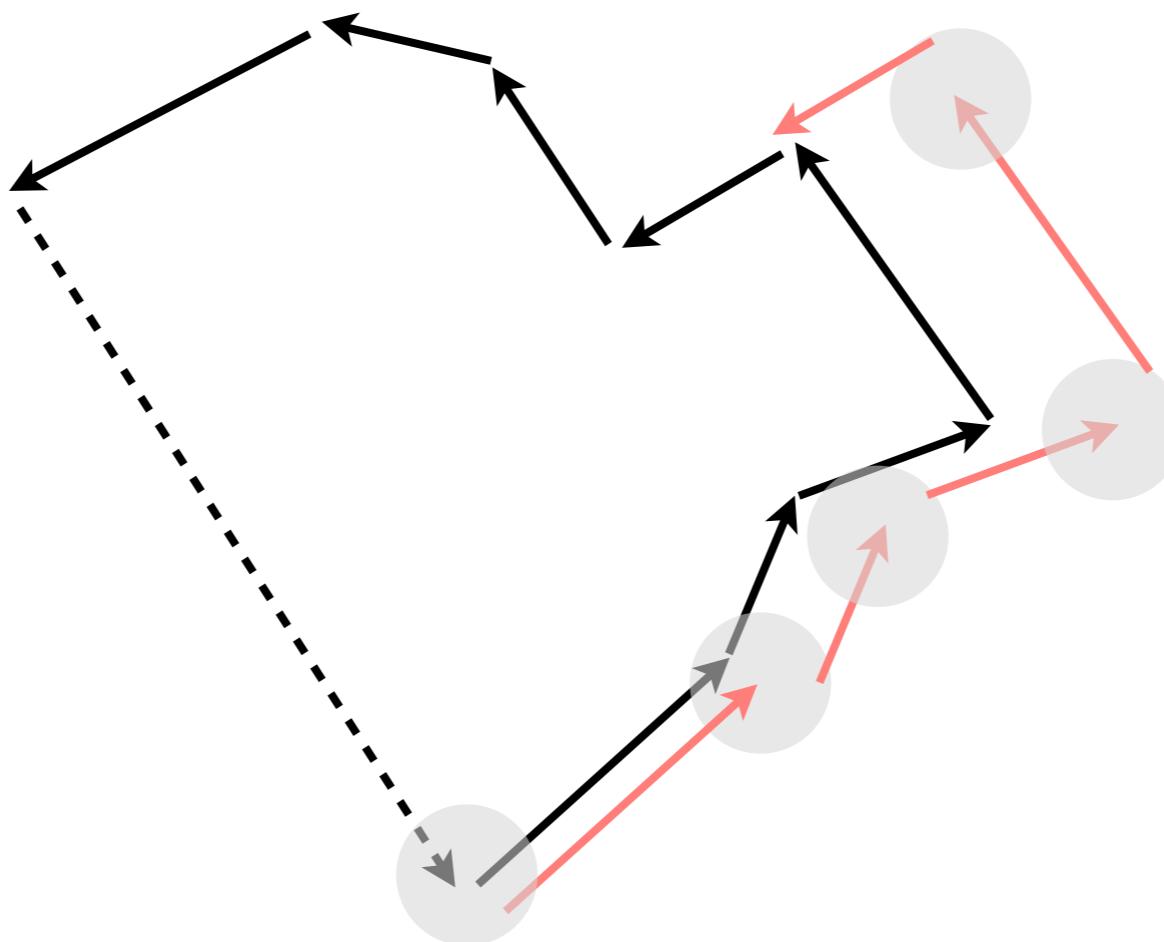
Errors accumulate during path integration:



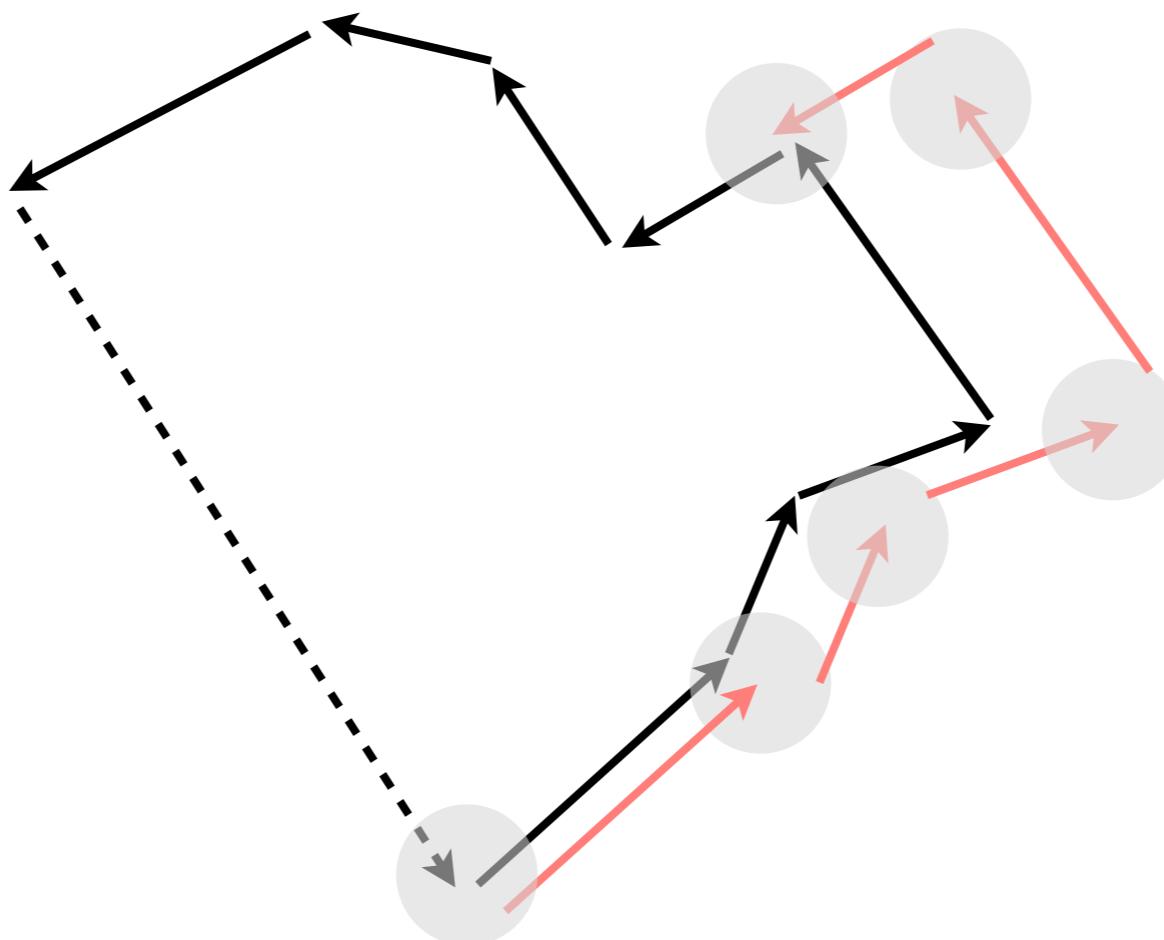
Errors accumulate during path integration:



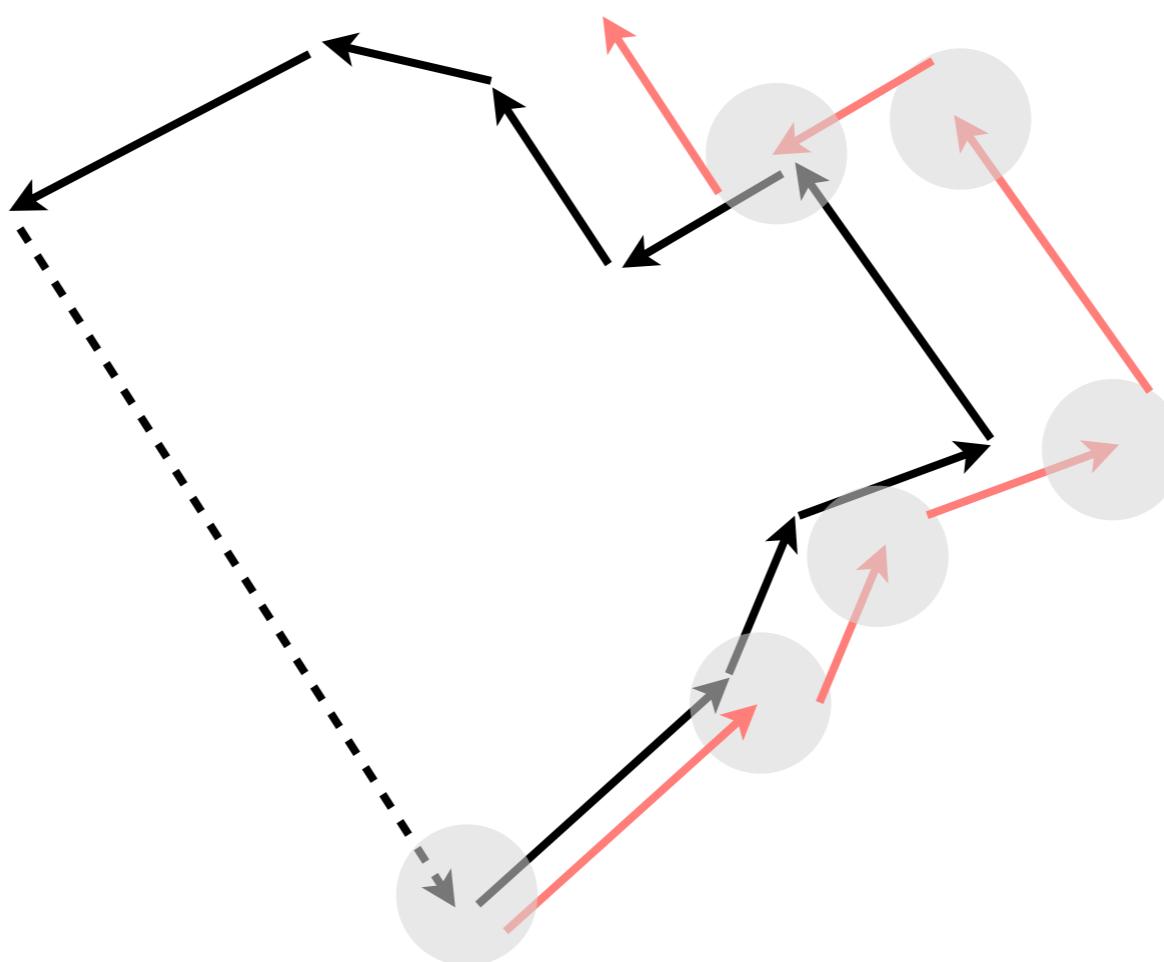
Errors accumulate during path integration:



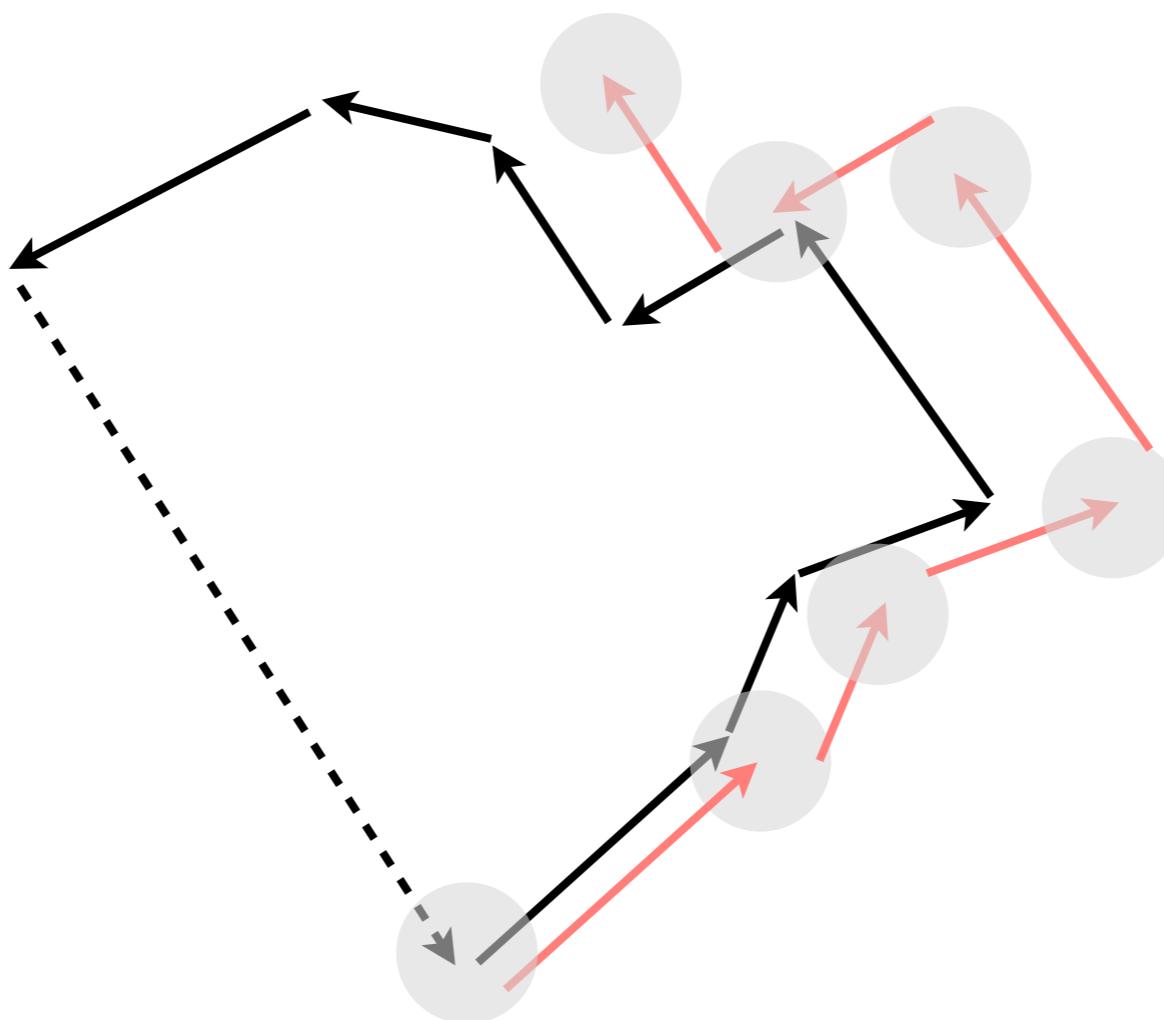
Errors accumulate during path integration:



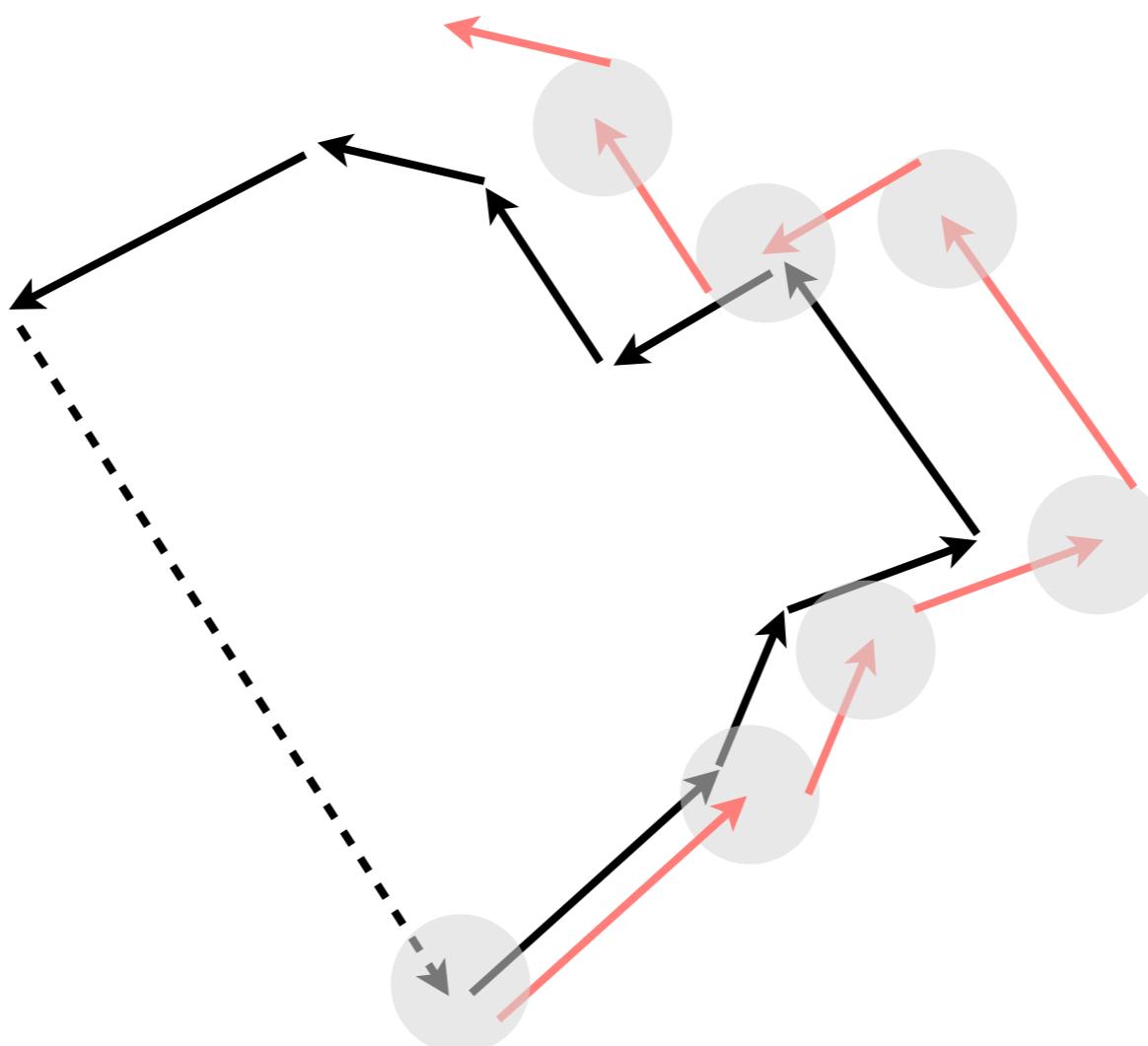
Errors accumulate during path integration:



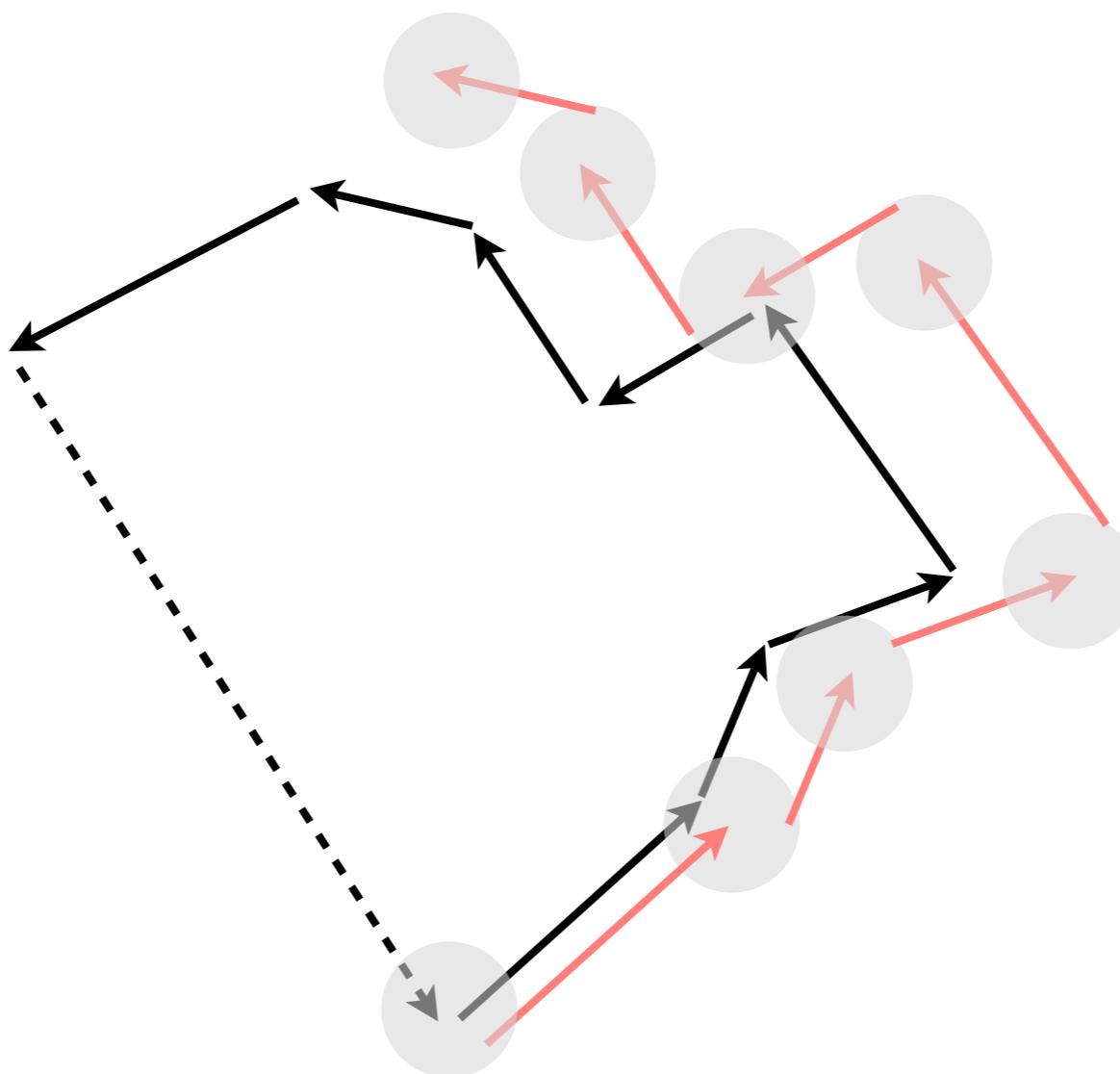
Errors accumulate during path integration:



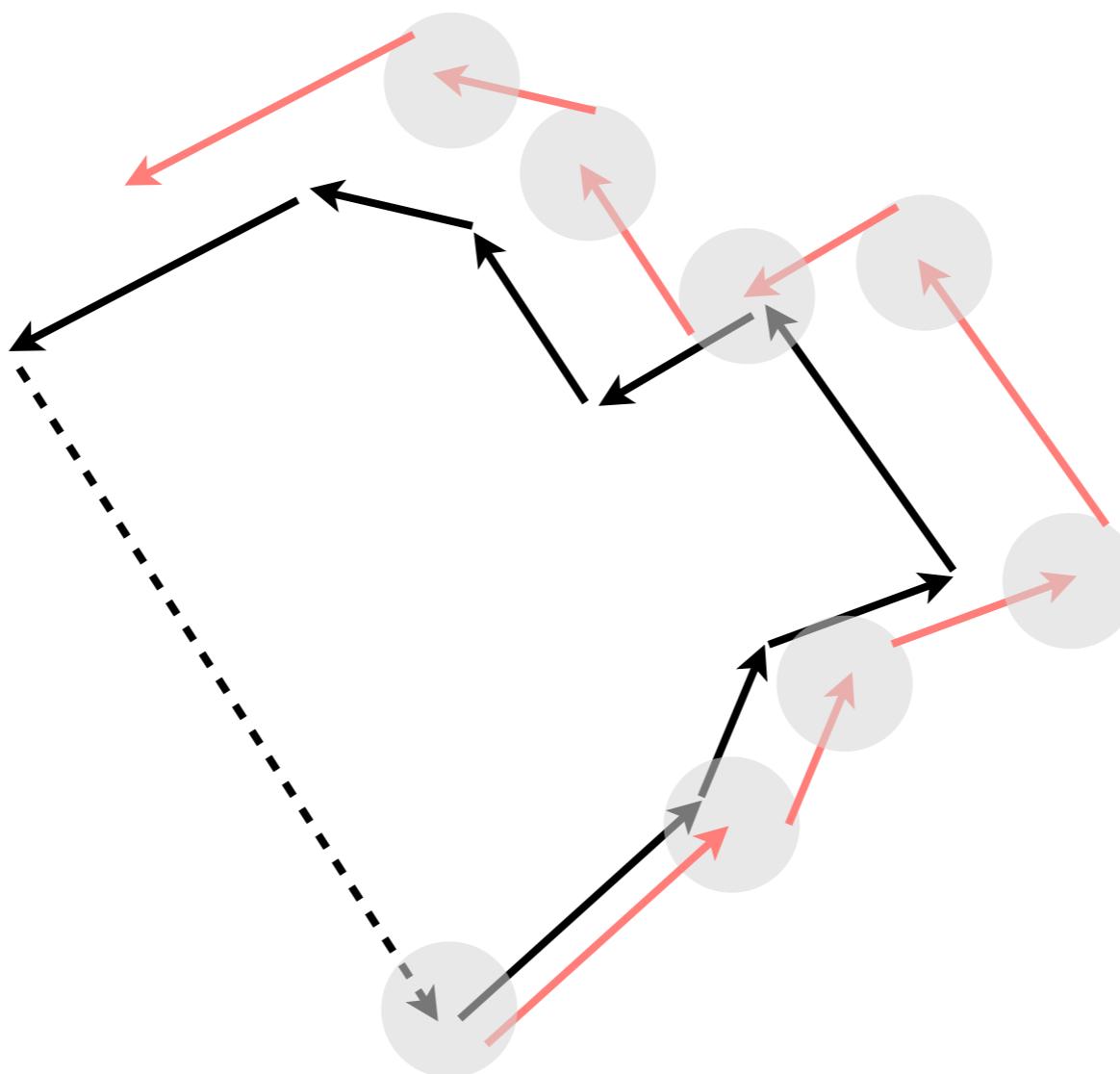
Errors accumulate during path integration:



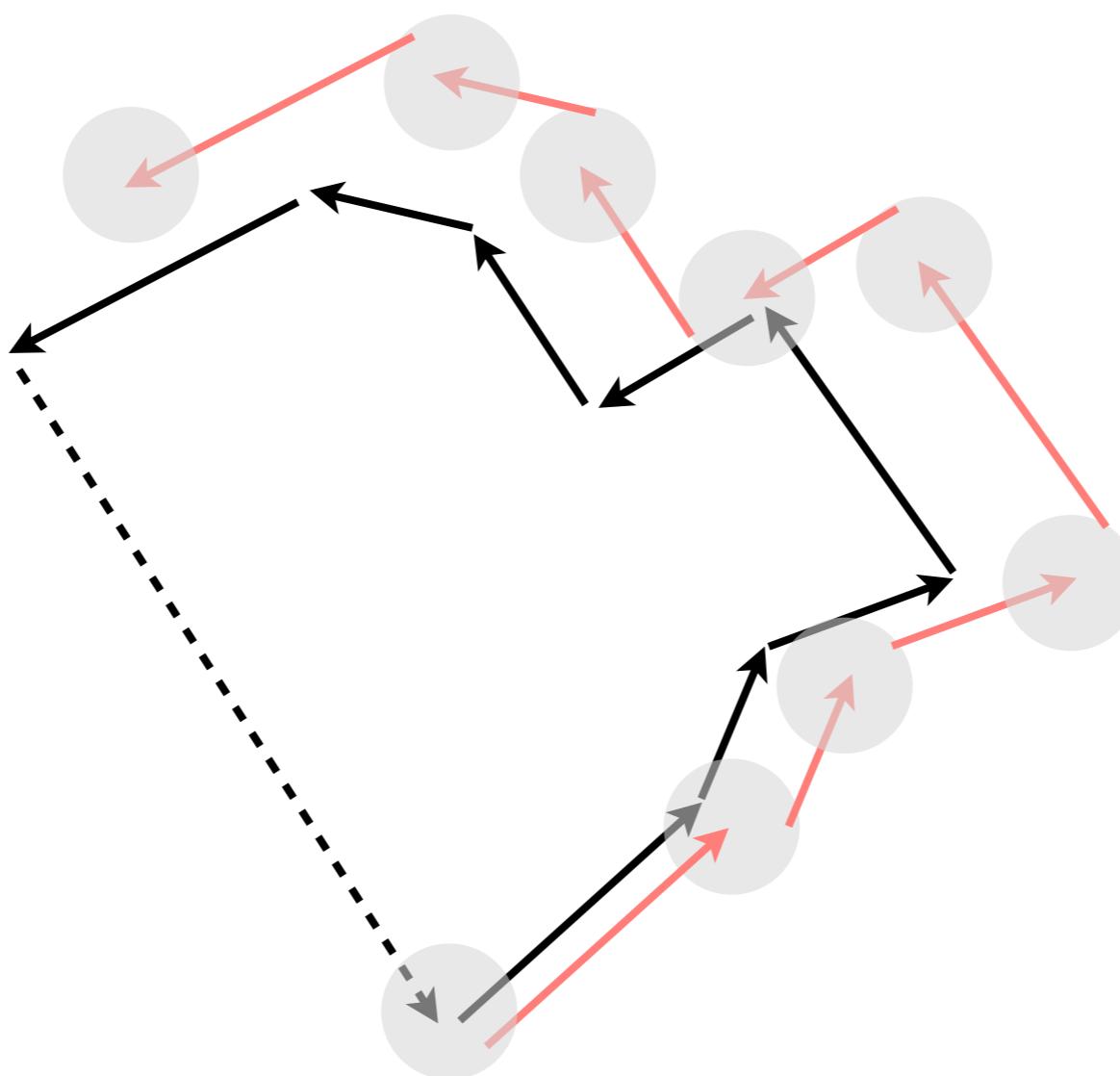
Errors accumulate during path integration:



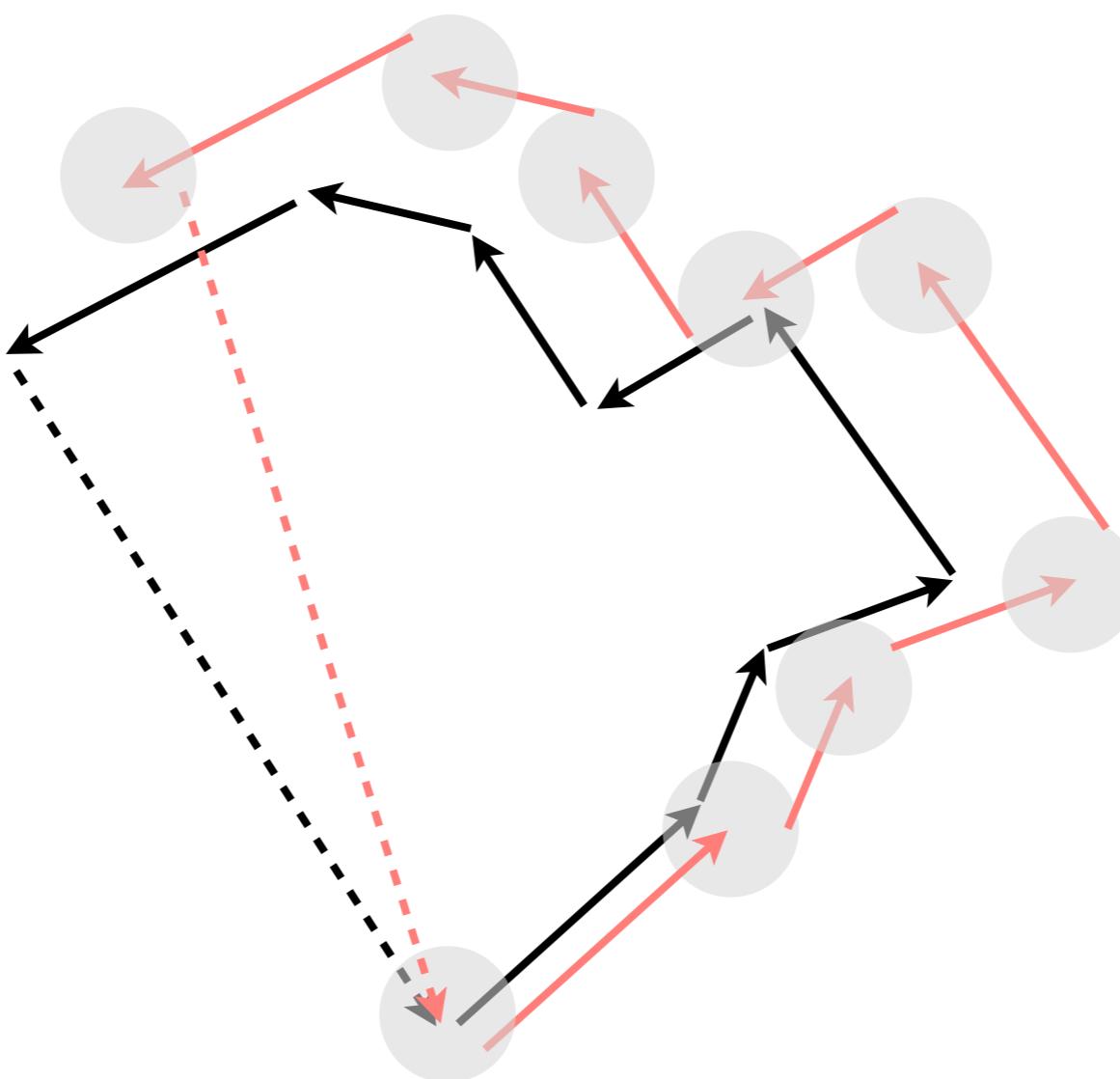
Errors accumulate during path integration:



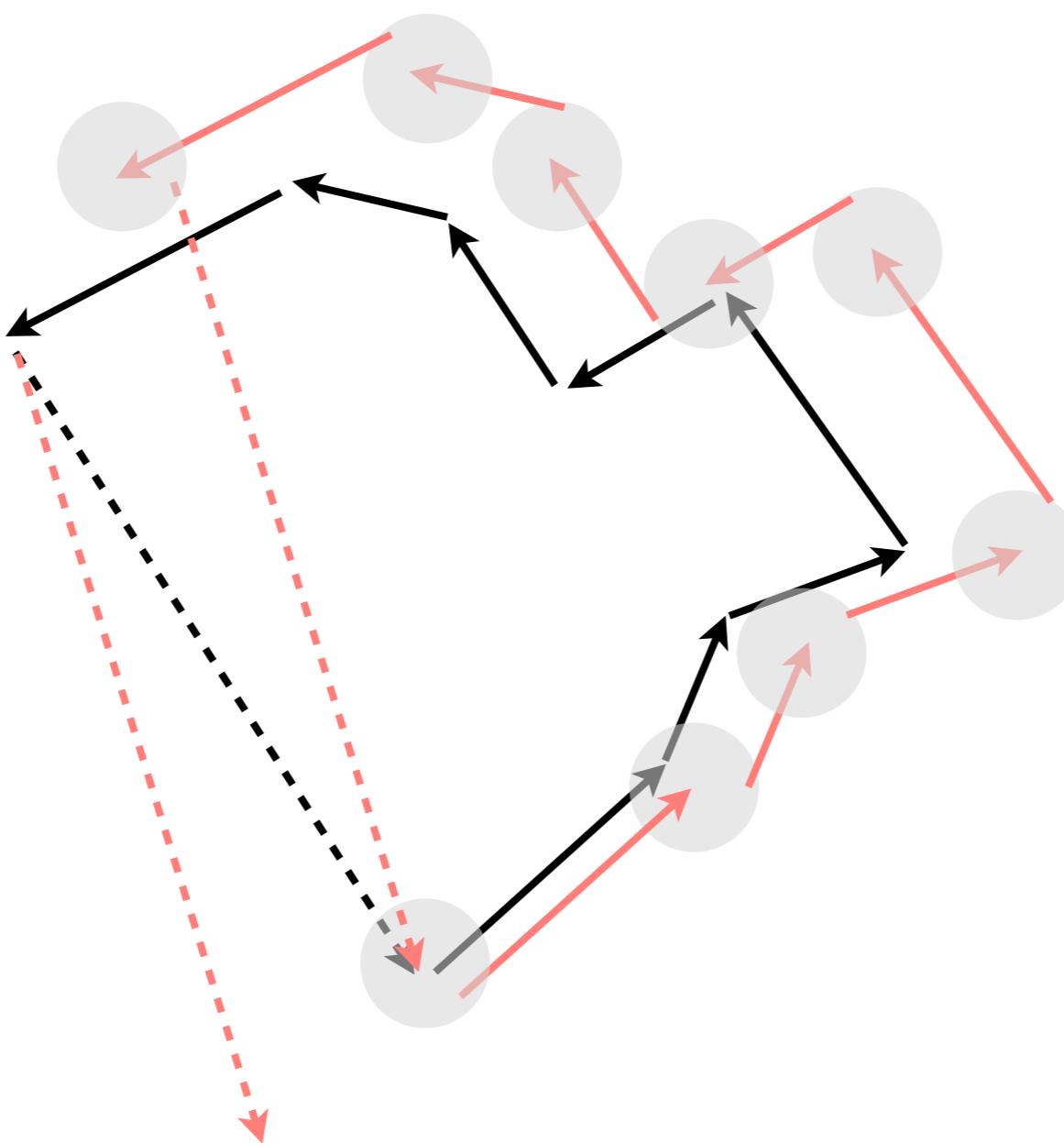
Errors accumulate during path integration:



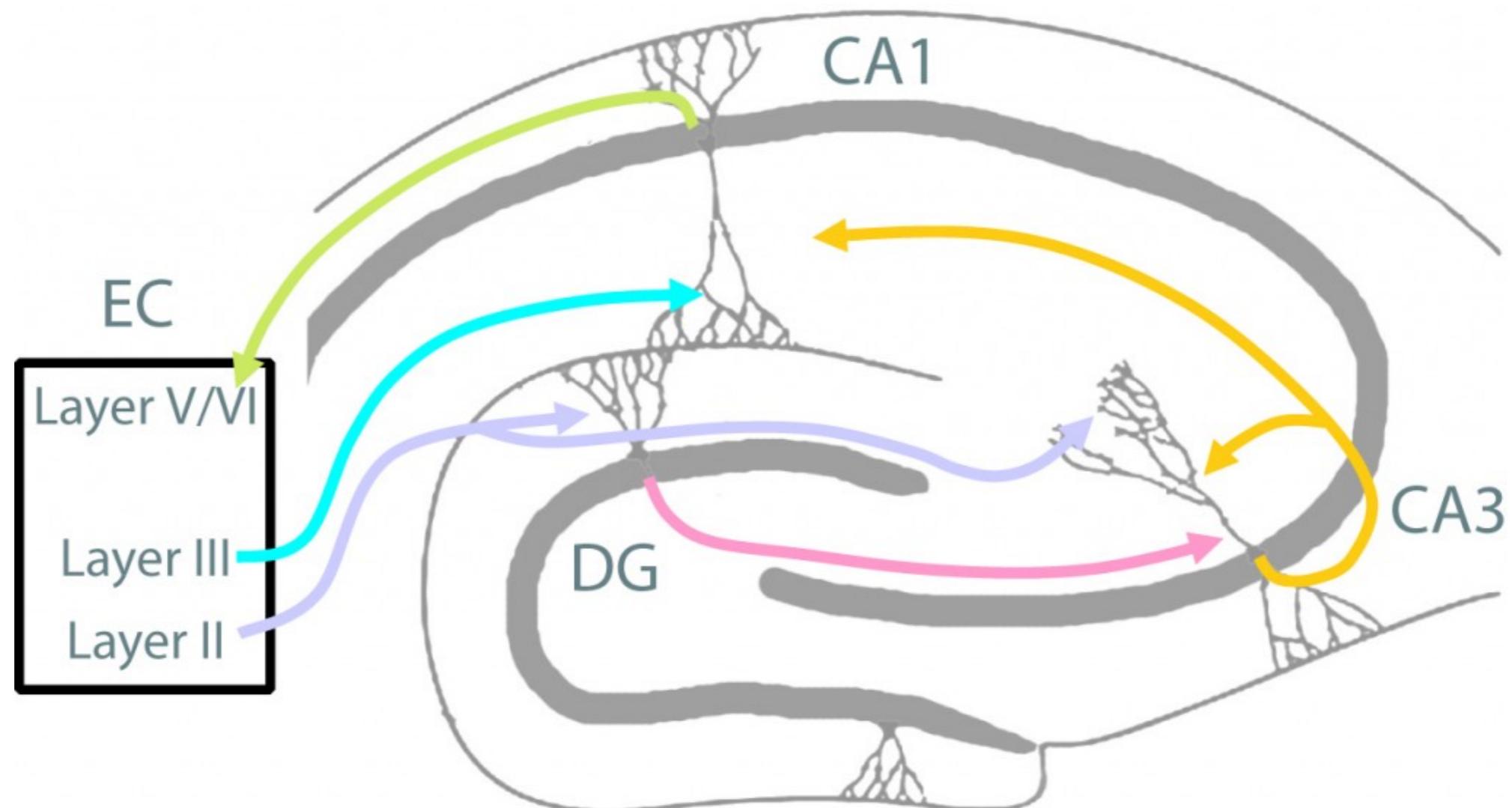
Errors accumulate during path integration:



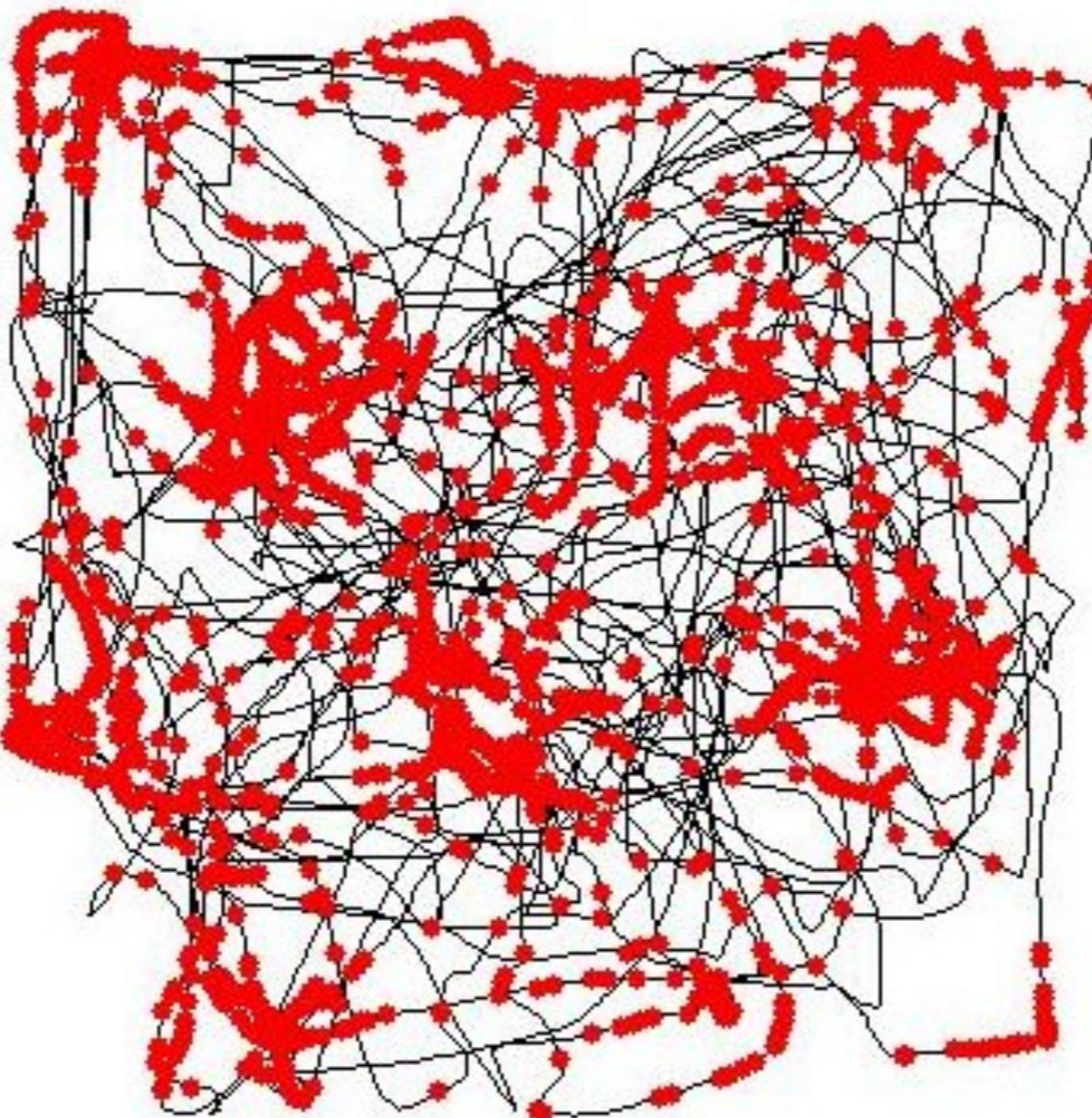
Errors accumulate during path integration:



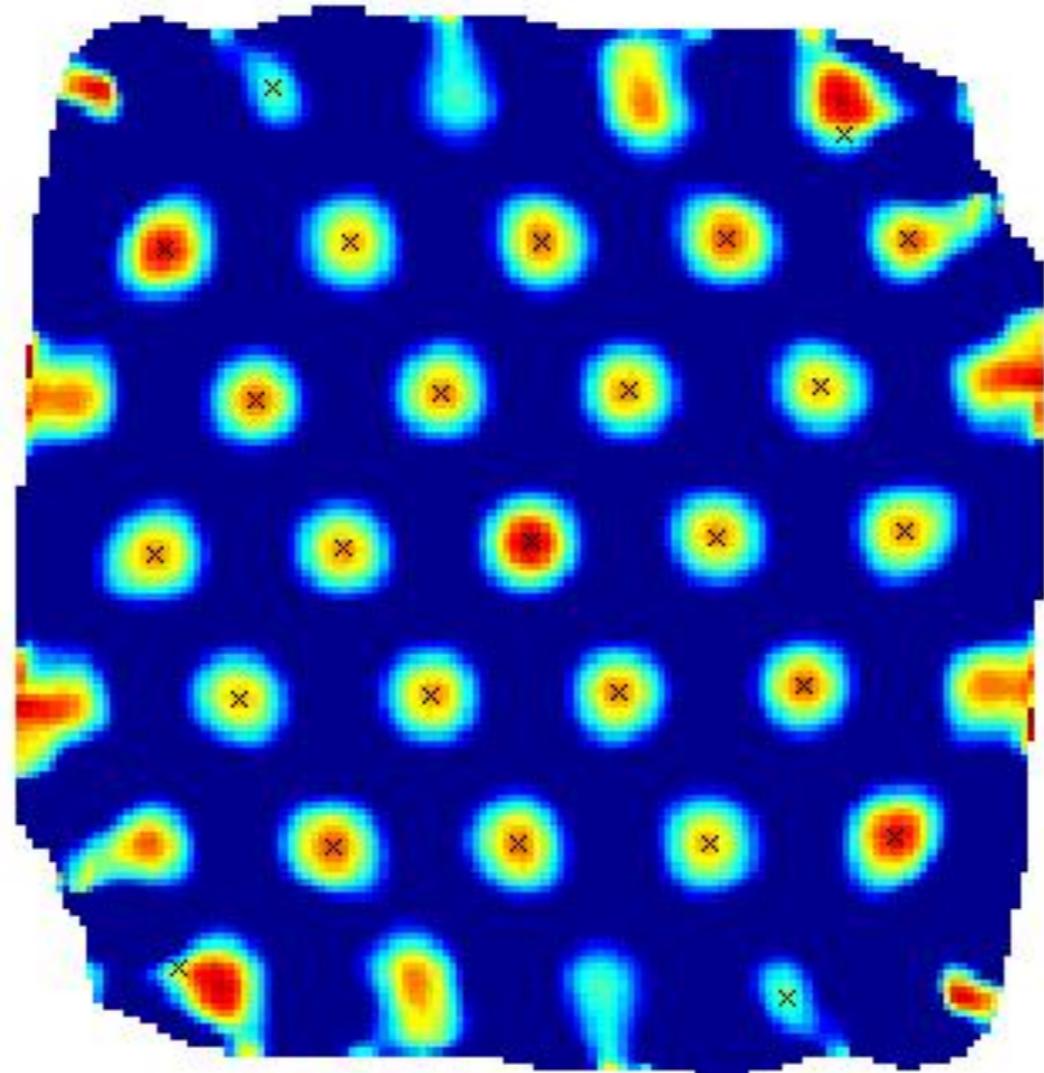
Recording from the entorhinal cortex:



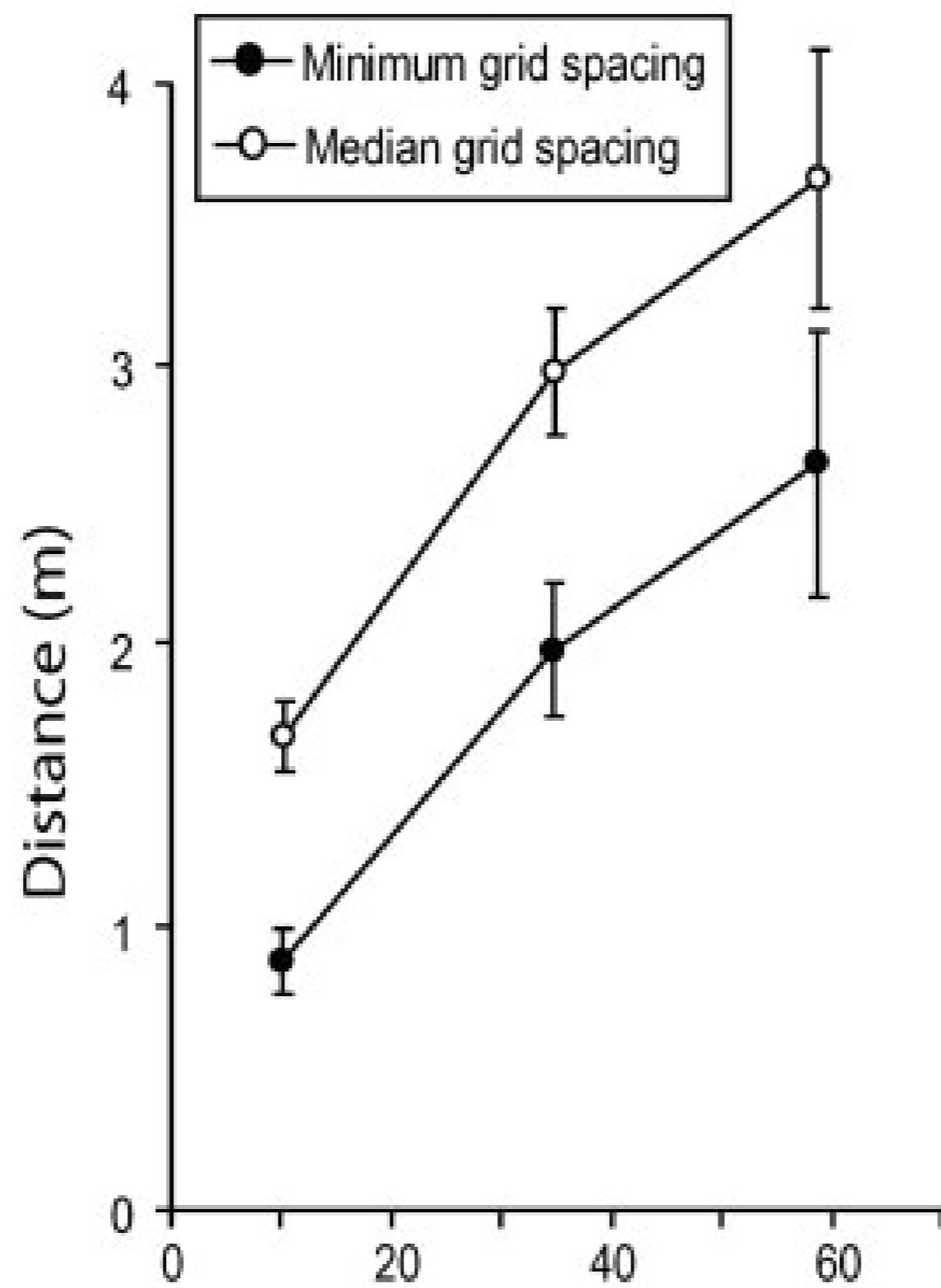
Spiking in the EC, the shocking revelation of 2005:



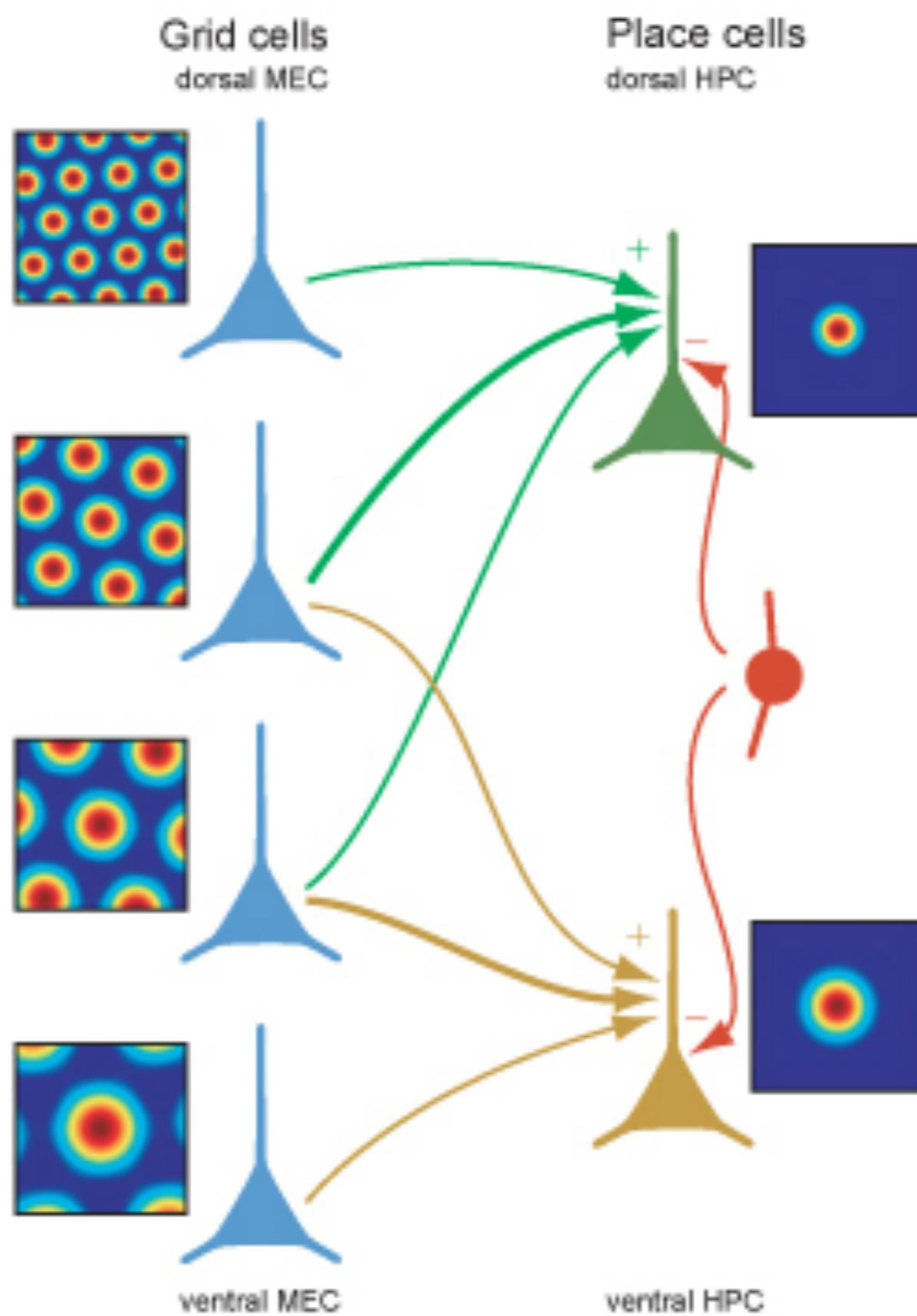
Grid cell spatial auto-correlogram:



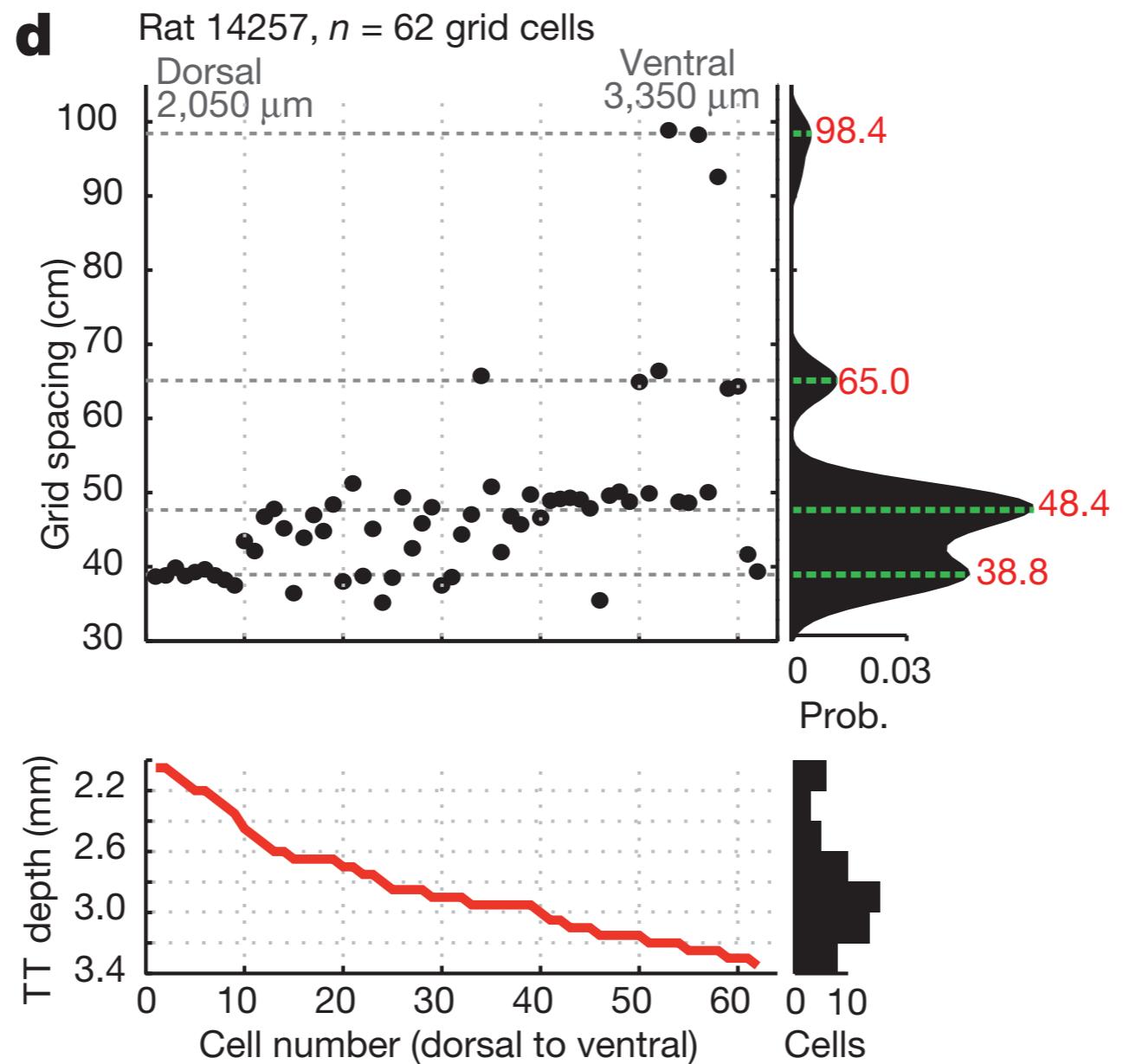
Spacing increasing along the D-V axis:



Grid cell topography:



Grid cells may even have discrete spacings:



Coding with phase and the Chinese remainder th'm:

Coding with phase and the Chinese remainder th'm:

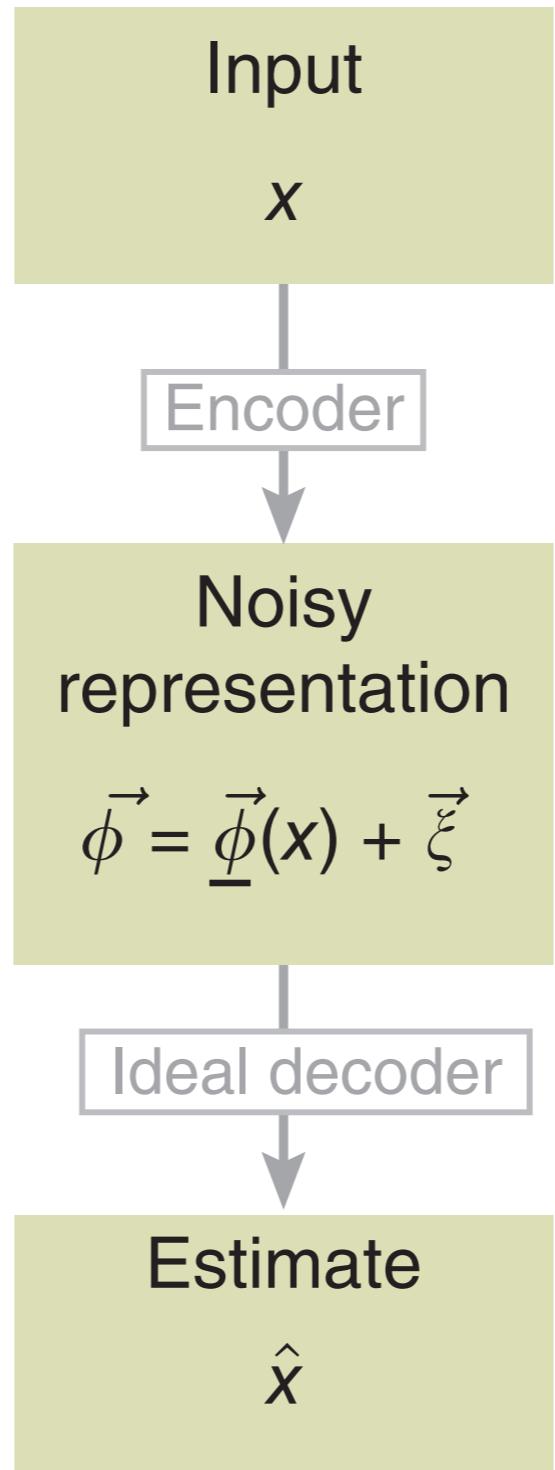
chalkboard interlude

An amazon.com warehouse:

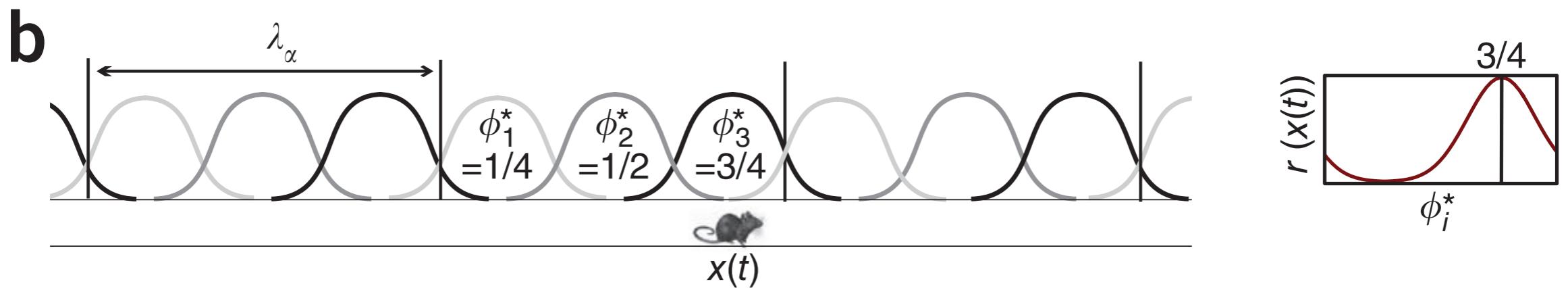




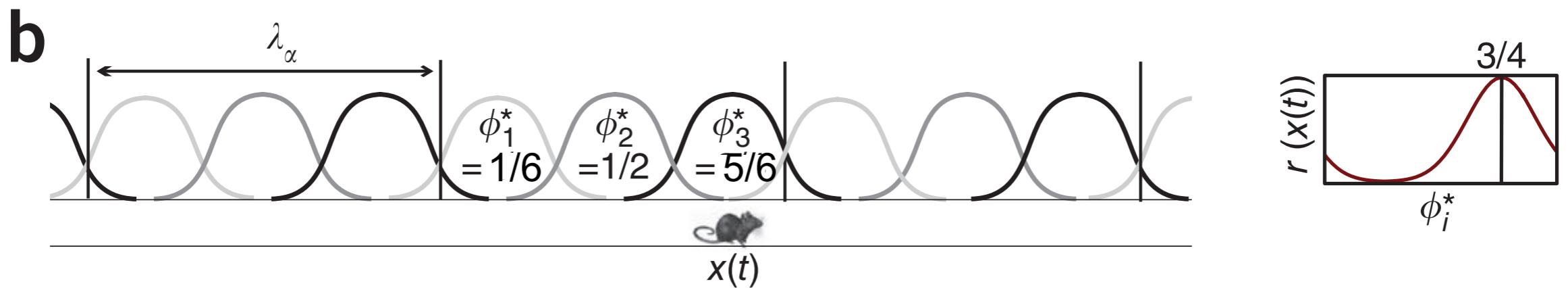
Channel coding:



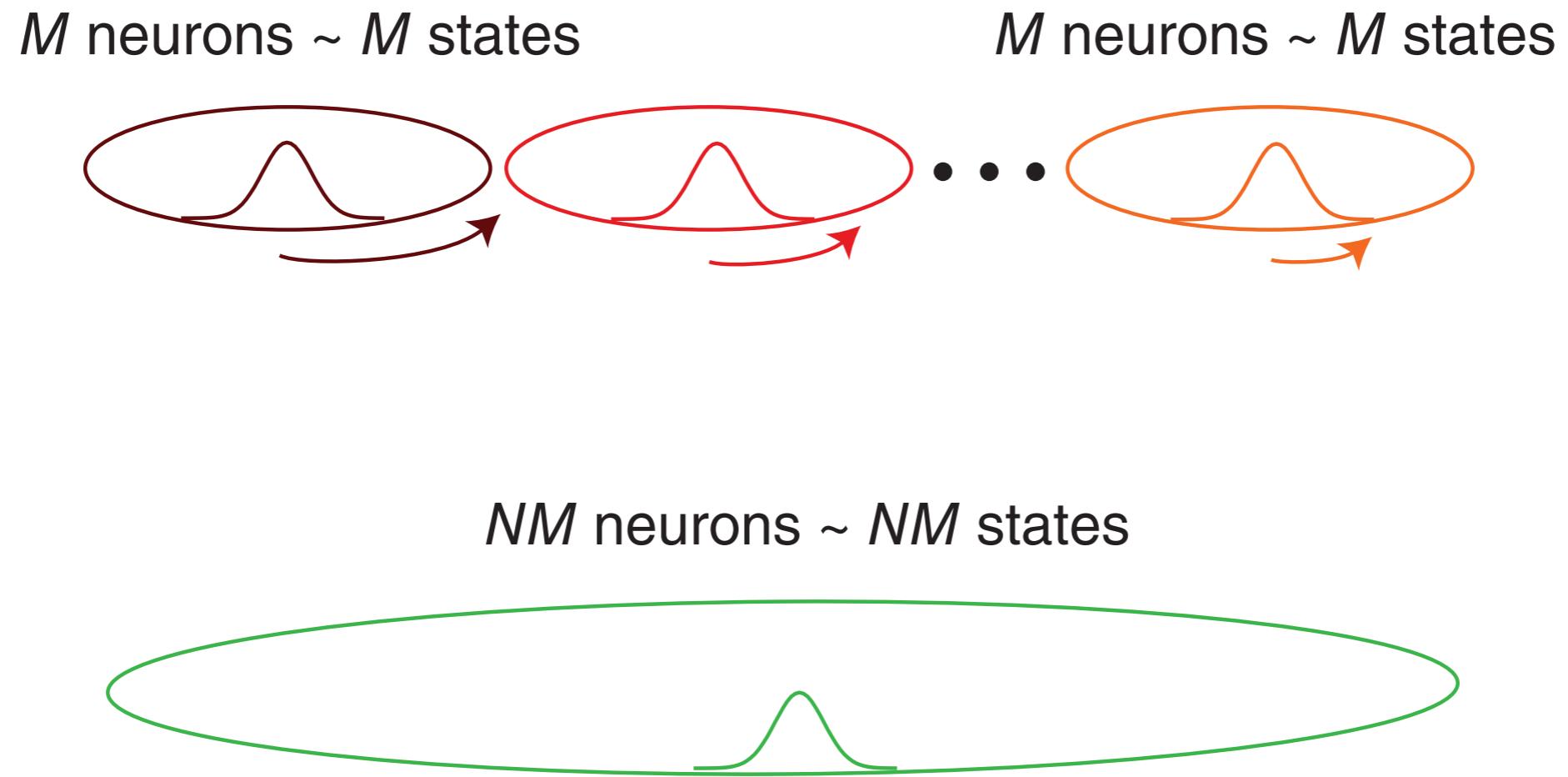
Coding for location with phase, 1D example:



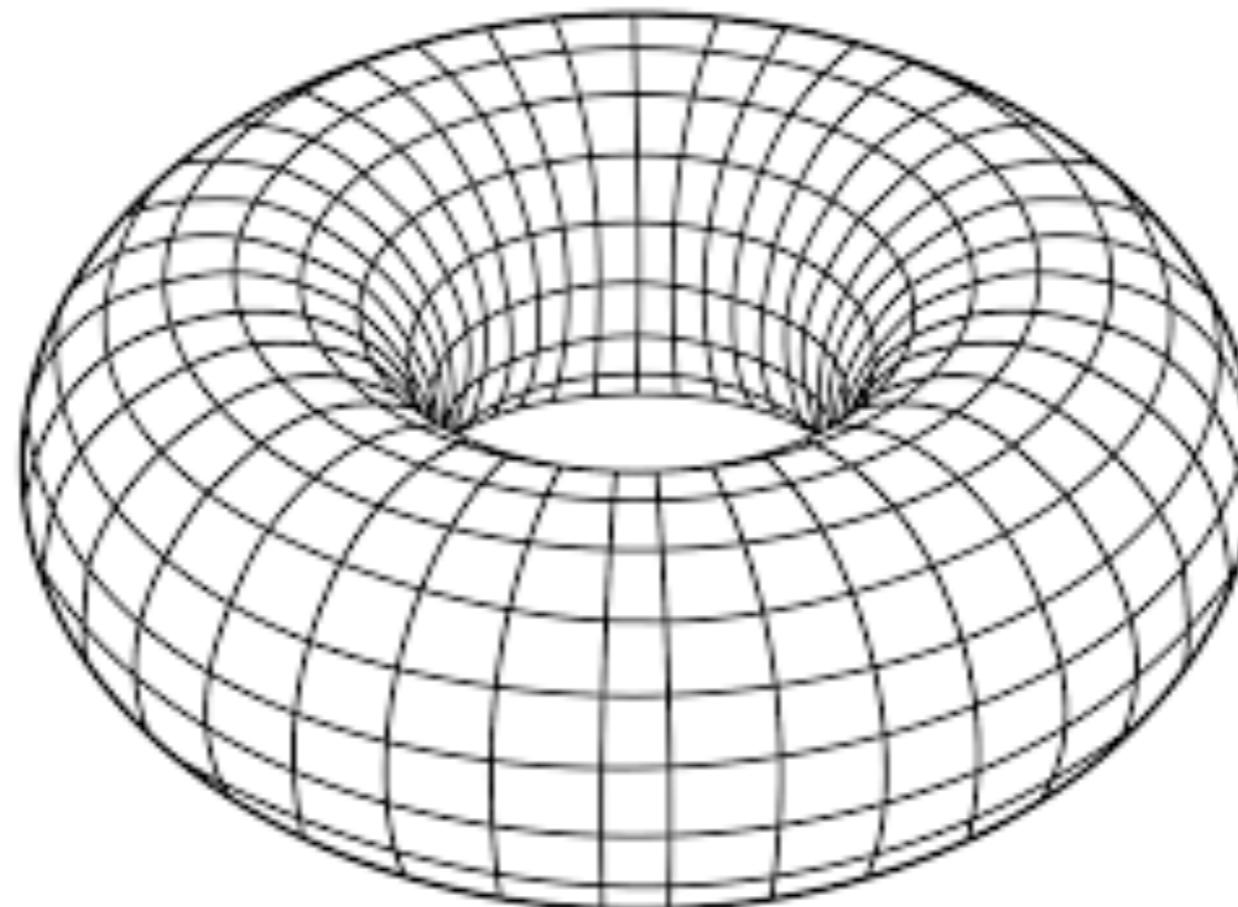
Coding for location with phase, 1D example:



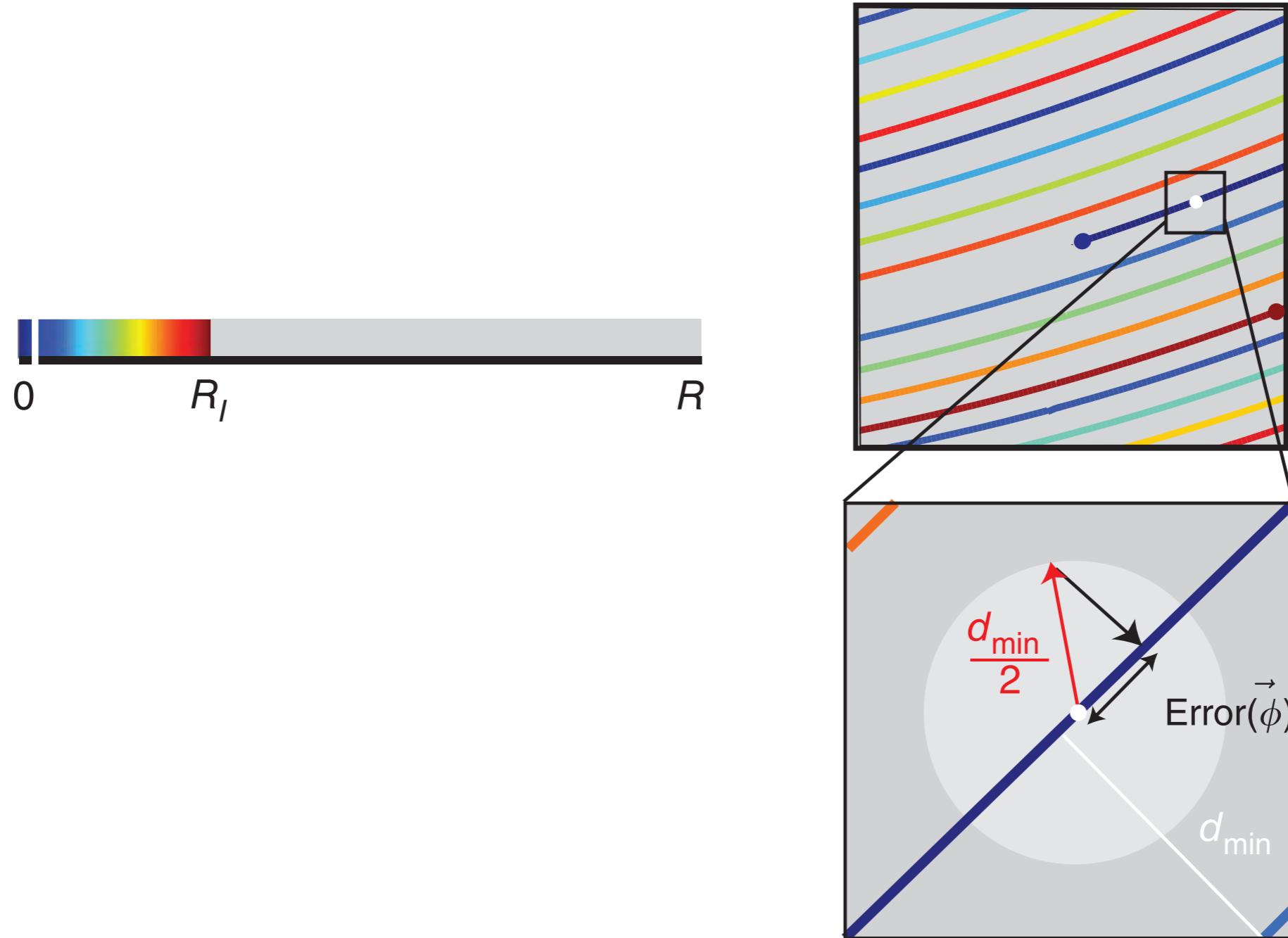
Subpopulations of grid cells:



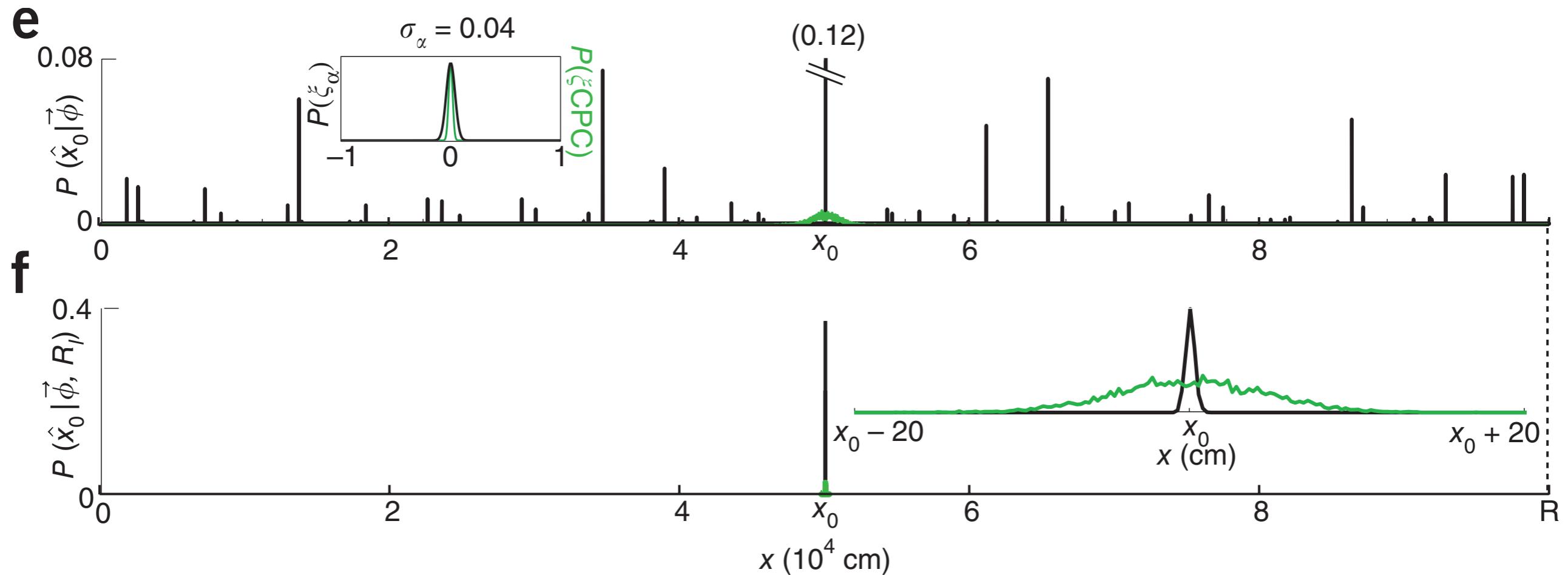
2 phase scales:



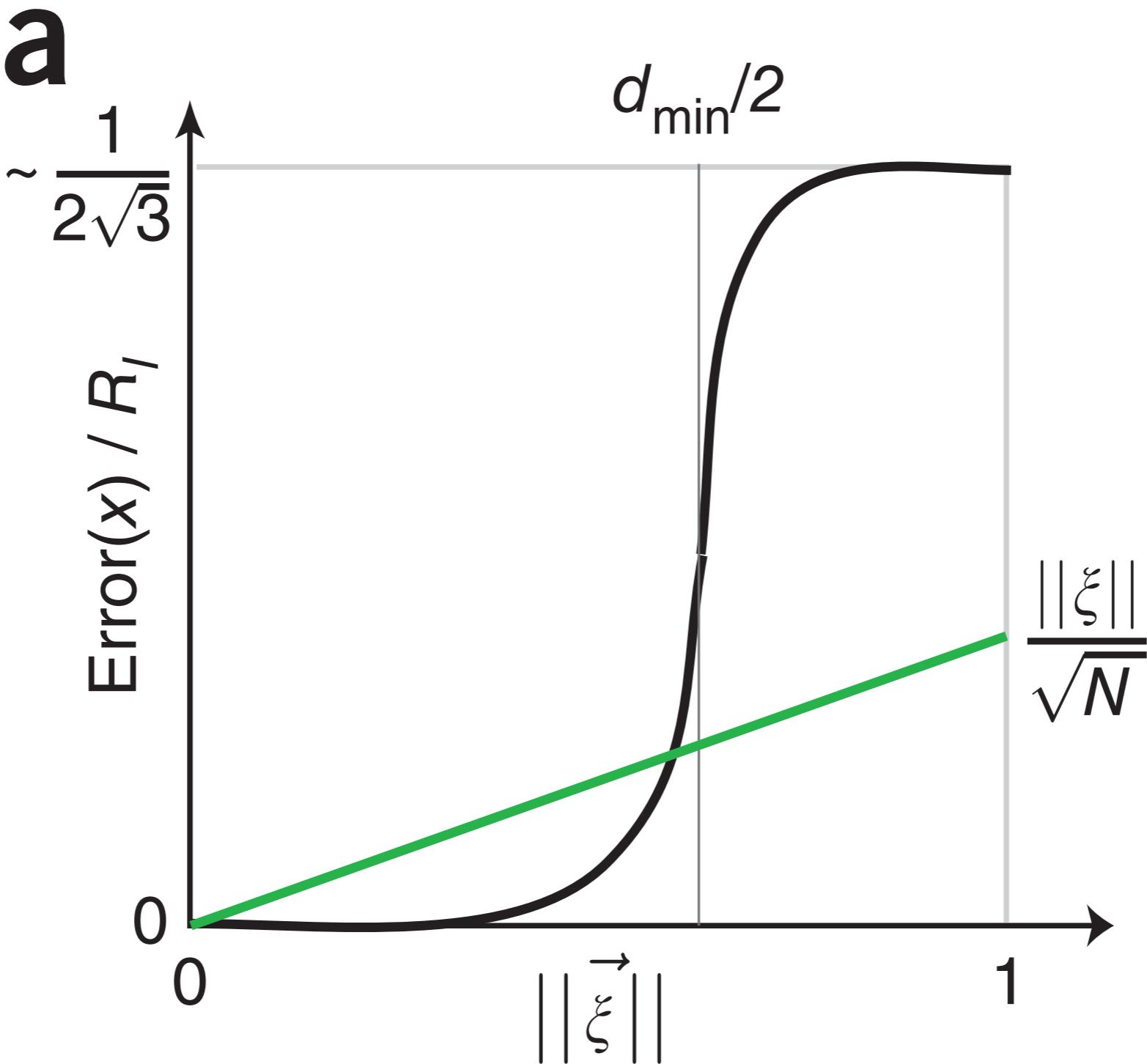
Coding for location with phases:



Posteriors for the two codes, CPC and GPC:



Grid cell codes fail spectacularly:



Decoder, scaling:

