fn accuracy_to_discrete_laplacian_scale

Michael Shoemate

December 21, 2025

This document contains materials associated with `accuracy_to_discrete_laplacian_scale`.
By `discrete_laplacian_scale_to_accuracy`, the relationship between α, a and *scale*, is:

$$\alpha = 2\frac{e^{(1-a)/s}}{e^{1/s} + 1}$$

A closed-form expression for s doesn't exist, so we use a numerical approach by a binary search.
A loose upper bound is provided by `accuracy_to_laplacian_scale`.
The binary search finds the smallest s such that

$$\alpha \leq 2\frac{e^{(1-a)/s}}{e^{1/s} + 1}$$