Design Explanations

# Boid-avoiding response equation

The following curve shows how strongly the boids react to the presence of another boid in their vicinity. This graph is the equation:

The X-axis is measured in pixels, Y-axis is the speed-multiplying coefficient.

A screenshot of a survey

Description automatically generated

The important aspects of this curve are 1) the two-step response, 2) low response for distant boids 3) constant region for nearby boids 3) strong response for extremely close boids.

1. The two step response allows for the boids to “casually” steer away from boids which are not posing a major issue.
2. Distant boids have a very minor influence over it’s own behaviors.
3. Nearby boid which have not been successfully avoided will perform emergency steering to avoid a collision.

# THE NEXT THING

The following curve shows how strongly the boids seek to steer toward the centre of the flock, with the “centre” being estimated based on the weighted contribution of every other boid, with this weighting formula:

The X-axis is measured in pixels, Y-axis is the speed-multiplying coefficient.

A picture containing ready, standing, group

Description automatically generated

The important aspects of this curve are 1) The smooth response 2) negligible contribution of boids further than 100-120 pixels

In future, it would be useful that this does not asymptote at zero, because a cluster of very distant boids will still have an effect over an isolated boid (or an isolated sub-flock) to re-join the main flock.