Depth VS Breadth

Horizontal Density – The HD is similar to the tempo of runners, indicating how quickly the appear each wave and how far apart they are spatially

Vertical Density –

Spatial Density – The HD and VD together, creating a square of the overall density.

**Tower Attack Types**

**Single Target** – The attack hits a single runner. The target chosen can vary based on the AI of the tower, choosing from –

**Closest Target** – The tower attacks the next closest target or the first target that comes into range.

***Implementation Pseudocode***

|  |
| --- |
| Tower contains –  Range: The range of the tower  Damage: The damage of the tower  Target: The current target runner. Initially **null**  *TowerAI*   1. if target exists 2. if *target alive* and in *range* 3. shoot target 4. else find new target 5. else find new target   *FindNewTarget*   1. For runners in radius 2. find Euclidean distance of runners 3. target equals smallest Euclidean distance   **Heuristics** can also be implemented**:** The tower understands that the most ideal enemy to defeat is usually the one farthest on its path or the one closest to your end goal.  A tower would need to know how close to the end goal a runner is to determined which of them to attack. This could be done simply by having a static value which decrements as the runner gets close to the end goal.  Ex: Every 10 steps, increment the heuristic by 1. |

**User Target** – The user may select a tower and directly change which runner it is currently attacking.

|  |
| --- |
| SelectNewTarget – set currentTarget to newTarget |

A subgroup of this is -

**Target Area** – The user may select a location for the tower to repeatedly attack until another order is given. Using this command can set up ideal locations / timing patterns for AoE attacks to maximize damage output.

|  |
| --- |
|  |

**Multi Target** – The attack can hit multiple runners.

**Lineal** – The attack hits runners in a straight line, dealing damage to some or all of them, depending on the type of lineal attack.

**Plus-Shaped** – The attack hits runners in two perpendicular directions, doing a Bomberman-like bomb attack.

**Bounce** – The attack bounces from target to target, dealing damage to consecutive targets. Often the damage is reduced over the bounce as the bounce gets weaker.

**Area of Effect** [AoE] – The attack hits a specified radius, often doing *splash* damage, which hits all targets in that area (sometimes for a percentage of the damage, based on how far away they are from the epicenter).

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

~ **Resources** ~

[*http://www.mindflare.com/wc3maps/Tower%20Defense%20Design.doc*](http://www.mindflare.com/wc3maps/Tower%20Defense%20Design.doc)