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|  | To tame the void |
| Technical Docs | |

# Galaxy Generation

## Background

* Map size is determined initially.
  + Should be a high resolution map.
  + Should be bigger than the screen (to allow for seamless zooming).
  + Max zooming should be around x4 or x8
* Generate Nebulae
  + Random Walk
  + Blur
* Throw some small stars (1-4 pixel spots) for good measure.
  + Use this as an intermediate layer for parallax scrolling.

## Star Placement

* Generate a los resolution, grayscale mask from background.
* Place stars randomly, with probability given by the mask.
  + Assign a blinking rate between 1 and 5
* Assign probability 0 to all pixels at a configurable distance from the placed points.
* Generate list of points
* Generate masks for star animation (blinking)
  + Use blurred bright start as an additional layer during play.
  + Alternatively, draw star effect dynamically to keep star sizes relatively constant

## Lane Generation

* Use Delaunay triangulation to find edges.
* Calculate minimum spanning tree (MST).
* Remove edges when the circumcircle area is much bigger than the triangle area.
* Put back MST.

# Implementation Order

## Iteration 1: minimal working set.

* Galaxy Generation
* Screen control
  + Main view
  + Zoom in and out
  + Move with cursor on borders
  + Eliminate scrolling
  + Zoom levels
* Economy I
  + Colonies
  + Basic production
  + “Next Turn” Button
  + Star/Colony selector
    - Colonize option
  + Basic Economy window
* Empires I
  + Initial empire definition
  + Everyone starts with a single ship in a central planet
* Fleets I
  + Fleet in Orbit
  + Movement
  + Basic design (ship id + number), no particulars
  + Fleet selection
  + Shipyards
    - Building
    - Upgrading
    - Building ships
    - Economy integration
    - Relocation
  + More detailed design: define several predefined ship types
    - Just increased sizes and power for now
  + Invasion as a fleet option (endless space)
* Basic AI
* Some audio
* Main menu
  + Save/load game

## Iteration 2

* Fleets II
  + Long-range movement (IDA\* search)
* Influence
  + Spy
* Tech
* Galaxy 2
  + K-means clustering
    - Empire initial placement
    - Randomly eliminate every but a few connections between clusters
    - Cluster bonuses (continents?) 🡪 choke points is probably enought
  + Procedural Backgrounds