

# Evolution Sim Pitch

## Market Research

- does this already exist in some form or other? for example like the primer youtube videos
  - (53) Rujik the Comatose - YouTube
    - Real time monster evolution
    - Procedural animation (turns 3d polygons into pixel art)
  - <https://www.youtube.com/watch?v=utO-KwXL9vA>
    - Creatures have evolving features to attack players
    - The creatures that survive while attacking the players will reproduce
- are there things we like about those?
  - Yes procedural animation
- things we dislike?
  - Its evolution from larva to adult, not evolution from species to species
- can do differently?
- how do we differentiate ourselves from them? why would ours be better/ or more fun to interact with

## Short description [ELI5] of what this is going to be?

- evolution game that starts with a certain state and evolves over time - creatures with certain features are naturally selected, there are more of them
- web app game/ unity mobile game, etc

## Detailed Description of the game

- how does the game start? are there initial parameters?

### Creature

- Creature Survival
  - All creatures need energy
    - Food will increase energy
    - Sleep can conserve energy
    - Actions and living will use energy
- What are creature stats

- Health (max and current)
- Energy (max and current)
- Idle cooldown
  - How long it will idle before trying an action
- Sightrange
  - Looking for things will cost more energy
- Speed
  - Will have more actions per minute, thus costing more energy
- Traits
  - A list of traits that make the creature unique, this will be further expanded later
- Genes
  - A genetic code that will determine the creature stats
- What are creature behaviors like
  - Creatures have three states, idle, action, danger action
  - Each action has a precondition, such as
    - sleep could be if creature has less than x amount of energy but more than x energy
    - move towards food must have food within sight range
    - breed (work in progress)
    - wander is when no other preconditions are met, and thus will wander in some specified direction
    - Check for danger
  - Each action will also have a weight ex
- Creature Traits
  - The traits can be categorized such that they will be checked by the correct action  
**ex:**
    - Movement
      - This trait can be checked to see what terrain they can traverse
    - Combat
      - This trait is checked when in combat
    - Stat
      - This trait is checked when the creature is first being created, and may change things such as the trait fat will increase the energy stat by a significant amount
  - Traits can have a gene multiplier, such that each time an offspring get the trait, the chance of this reproducing is more likely
- what are they going to look like? can be simple to start off
  - Simple blobs, no limbs, only mouth and eyes

- Genes
  - the number of traits a creature can have will be tied to the number of genes a creature has, that way creatures will become more complex over time
  - The genes will be used to determine the creatures stats with equations (the equations shouldn't matter too much, as long as they differ from each other)
    - Size may be the first thing to be calculated
      - Then health is some fraction of the size
      - speed can be the fraction of the max speed of the size
    - sight range can be individually calculated
    - traits will be calculated based on the stats given to the creature
- Breeding
  - In order to breed, a creature will request another creature to breed
  - Once the creature accepts the breeding request, the one who requested will go towards the breeder
  - By having request, and check if there is a request be weighted actions, we can overtime create "gender roles" through evolution
  - We can then have traits that will either increase the likelihood for creatures to want request to breed, or have higher chance of being accepted
  - This will also likely make it so only one "gender" will have higher breeding traits since only one side needs them
- Gaining new traits/mutations
  - traits will be gained at some chance when they are created by breeding
  - the likelihood of certain traits will be increased by a trait multiplier from the parents
- Food Spawning
  - For the time being, food will spawn at a set rate, and only during the day, this may encourage creatures to rest during the night
  - All food will be the same, and restore x amount of energy
- Complex Food system
  - Plants will grow food over time, the amount of energy that the "fruits" will give will also grow (possibly by 1.5) per day making it more worth to wait til the fruit is fully developed
  - Plants will also have different methods to spread itself
  - Plants can die or be eaten
  - Plants will have their own mutation stats and traits, much like creatures
- Environment
  - The map can randomly generated using Perlin noise, this means that seeds can be saved and is generally somewhat easy to implement

- Features of the environment will include
  - Bodies of water
    - If its shallow, it will cost more energy to cross
    - If its deep, it may either cost significantly more to cross without the right mutation or simply be impossible to cross
  - Plants
    - Fruit bushes
    - Trees
  - Rocks (obstacles)
- And will be 2D
- What can the player manipulate?
  - The player could manipulate the amount of food spawning in
  - The temperature/weather
  - The amount of bodies of water
- Environmental Disasters
  - Natural Disasters
    - Floods
      - may make most tiles “flooded” thus all animals will consume more energy to move
      - May be difficult to properly implement without “elevation”
    - Drought
      - No water, thus less plants will spawn or survive
- Genetic Tree
  - The Game should keep track of the stats and sprite of each new variation, along with a visual tree

## Objective (of the game or app) — what’s the point? how do you “win”? if at all

Arena harsher environment

Challenges breed for a specific thing

Try to change the environment, while not destroying the eco system

## Who will use it? how do people engage with it?

Players should check it semi regularly, but mostly look at the changes

Players should be able to zoom in and out

Players should be able to click on creatures and see its

- stats
- current actions

Players should be able to change the environment

## Platform - web/mobile? online/offline?

Engine → Unity

- Only need to pay per install if using unity 6 (not released yet), using the pro or enterprise version (not using that) or has over 1 million downloads

Offline

- Days should go quicker
- No Multiplayer

Online

- Days should be set to the server clock
- All the creature logic will be placed on the server rather than the client, and the positions and stats will be forwarded to the client

## Milestones

- MVP - what's the most basic version of this that we can build quickly and start playing with?
- V1 - what's the first thing you add from here to improve it? for example - a server? enabling concurrent multiplayer interaction?
- V2 - ...

DNA production of certain proteins presence/quantity of certain proteins yields certain traits

A [11111111011111111111111111111111011111110111111]

B [11111111011111111111111111111111011111110111111]

C [11111111011111111111111111111111011111110111111]

$A * B - C \wedge D \mid E = 1 \text{ or } 10$

fight vs flight = speed + weight / factorX

special traits

- when a certain trait level is above or below a certain threshold, the creature has a % probability of getting a particular special trait
- offspring have higher probability of getting this trait