**PREY PREDATORS MODELS**

Real time / continuous time simulation of the interaction between prey predators populations

Preys eat food source

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Food source => Grass, Shrubberies, Just regrows with some randomness, different nutritional values ?

Preys

Behavioral decision making process

Energy need ? Threshold to breed, feed, influences priorities

Ray casting analysis of surroundings

Attraction to food

Aversion to Predators

Risk aversion factor

Herd mentality versus lone wolf mentality

Idleness behavior ? Seeking things vs idling

Reproduction model => simplistic : averaging traits of parents + mutation randomness perturbation

Random sex if sexual differentiation => mate seeking in characteristics

Communication -> warning call / stress communication and mating call maybe ? Greater range

Line of sight ?

Range of vision

Metrics => population

Average risk aversion of preys etc to study trends d

In this project, we propose to simulate the behavior of preys and predators with the aim to study the influence of certain parameters on the flourishing of their respective populations. To this end, we consider a set of creatures evolving in a planar environment that compete for ressources in order to insure their survival. The behavior of said creatures is simulated in real time through the maximization of their individual utilities, expressed as a function of their environment as well as their idiosyncratic attributes. The behavior of said creatures is simulated in real time as a function of their environment as well as their idiosyncratic attributes. Among the environmental decision making criteria are the proximity of the creature to preys, predators and ressources. In conjonction with these external parameters, the attributes of the creature in question, such as its energy levels, physical capabilities and behavioral inclinations, intervene in the determination of the action it prefers to undertake next.The first option with an affordable energy cost within the list of options ordered by the utility is then performed. Once survival of the creatures is ensured, secondary needs take a more predominant role, namely reproduction. This mechanic allows the generation of new creatures in the simulation, whose attributes are passed on from their parents. We then plan to monitor of various trends within populations in order to get insight as to the prevalence of given traits and their impact on survival.

advantages they may constitute.

given by a certain trait

In the case of prey -> energy from environment

Predators -> hunting and consumption of prey

**The option with the highest utility among those with an affordable energy cost is then performed**

In particular,

First condition

Possibility to exhaust required amount of energy to perform said action

Mention that actions have an energy cost

Energy expenditure cost/benefits of undertaking certain actions

With the primary aim to Sustain and survive

Once survival/ sustenance needs are met, secondary needs ->

This project proposes to

SIMULATE PREY PREDATORS MODEL

With the objective of

STUDYING THE INFLUENCE OF VARYINGS

We consider

PLANAR ENVIRONMENT  
SET OF CREATURES

Real time simulation of prey predators populations

In a predefined environment

Monitoring trends in populations and subcategories filtered by certain characteristics / traits

Decision making AI of the prey predators

Based on energy expenditure