**REPORT ON THE VERLET INTEGRATOR**

Introduction

The aim of this report is to explain the Verlet Integrator we developed.

Our goal in the integrator is to have an interactable integrator that, given an initial data, in our concrete case the initial position x and y, speed vx and vy, acceleration ax and ay, a radius, a density and elapsed time, it computes their values at the end of that given time. Our intention is that it will also have a way to test the correct function of the integrator, which will print every frame and it will be able to pause it and a graphic representation. In addition, the Newton's Laws will be implemented in order to compare the results of the integrator with the final data and see the accuracy and the standard deviation.

FORMULAS

To summarize, the final result of the integrator should have a welcome and small tutorial/explanation of how it works, the input of the data, then select whether the user wants to test the integrator or they want only the final results. If they choose the first option, every frame will be printed on the console, which can be paused, showing the data of the last frame, a pause signal and the results in that same position calculated with Newton's Laws and that can be unpaused again to continue the test. On the other hand, if the user chooses to only show the final data, the initial data, the final data calculated with the integrator, the final data calculated with Newton's Laws and a graphic representation will be shown. In both cases will be possible to go to the main selection again once finished.

Implementation

The verlet integrator

Test of the integrator

Final data show

Forces

Frame rate

Input

Pause

Other things you have implemented, why you did it, how you did it, how it works

Newton's Laws

"Interface"

Graphic representation

All the code comes together and how it works

Results

Tests we want to run (conditions, initial data)

Results of the tests (with images!)

Standard deviation

Comparison with other integrators and Newton's Laws

Compare results with Newton's Laws

Compare results with other integrators (ask classmates)

Conclusions

Conclusions

NÚRIA

TOMÁS

ALBERT

RAUL ALEX ENRIC