

Rigid Body Dynamics: A Graphical Simulation

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Abstract

Dynamics is the study of the interaction between different bodies and forces based on the laws of physics. The possible implications of a computer simulation in which dynamics are simulated are endless. A working dynamics simulation would be useful to engineers who are interested in designing a building, students trying to grasp the law of conservation of momentum, or even video game programmers who want their games to be as realistic as possible.

Introduction

The goal of this project is to design and program a fully functional, efficient, rigid-body dynamics simulation capable of supporting objects of variable shape and mass. Because of the inconsistencies between two-dimensional and three-dimensional dynamics, this project will be focused on only the two-dimensional aspect for the sake of simplicity.

Procedure

The simulation will use a very object-orientated framework to allow new dynamics and bodies to easily be implemented later on. Testing will be conducted in real-time with visual observation of the graphical display of the simulation.

Expected Results

The final goal of this project is to simulate dynamics realistically and efficiently. The expected result of the final version will be able to simulate interactions between any convex polygonal body, with friction.

