

# **Project plan - Visualization of smoke using particle systems**

Project plan for Bachelor's essay in Computer science at KTH, Spring 2013

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## Introduction

Particle systems is a technique used to model objects that are difficult to model with classical surface-based modelling. Objects that are dynamic, change over time, or that are fuzzy, fluid or in other ways non-static may be modelled in a more realistic way using particle systems.

Particle systems focuses on creating a volume of particles, with individual properties, rather than a surface with a texture. With this technique it is possible to change each individual particle's appearance over time and in this way creating visualizations that in a realistic way show fire, smoke, water, explosions and with some alterations even hair and fur.

This technique is very interesting because it is very useful. Special effects are essential in many new movies, be they animated or motion capture. In many movies you can see big explosions of buildings or cars, and it is of course a lot better to animate these explosions than to blow up a building.

## Problem statement

The goal is to create realistic looking and behaving smoke using a particle system.

## Approach

We will study the subject of particle systems by looking up articles and other resources that may be of interest. When we have become well versed in the area we will implement our own solution of modelling smoke using particle systems.

In order to set up a realistic goal for ourselves we will ignore all features regarding light. Instead we will focus on behaviour when interacting with bodies and other gases including itself.

## References

<http://www.lri.fr/~mb/ENS/IG2/devoir2/files/docs/fuzzyParticles.pdf>

<http://www.red3d.com/cwr/boids/>

[http://www.gamasutra.com/view/feature/3157/building\\_an\\_advanced\\_particle\\_.php](http://www.gamasutra.com/view/feature/3157/building_an_advanced_particle_.php)

<http://double.co.nz/dust/col0798.pdf>

<http://processing.org/learning/topics/smokeparticlesystem.html>

<http://classes.soe.ucsc.edu/cms161/Winter09/projects/galbrech/finalproposal.html>

## Time plan

