

# INF585: Computer Animation

## *Expecto Patronum*

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# 1 Introduction

In this project, we aim to model an animated scene from the third Harry Potter movie. In one of the final scenes, Harry is attacked by a group of dementors, big dark creatures that feed on human happiness and thus generate feelings of despair in any person in close proximity to them. The Patronus Charm is the most powerful defence against dementors. In order to conjure it, a wizard or witch must think of a happy memory and must say the incantation "Expecto Patronum". If done correctly, this charm emits a silver misty animal that acts as a protective guardian.

Here's a preview of the modeled scene:

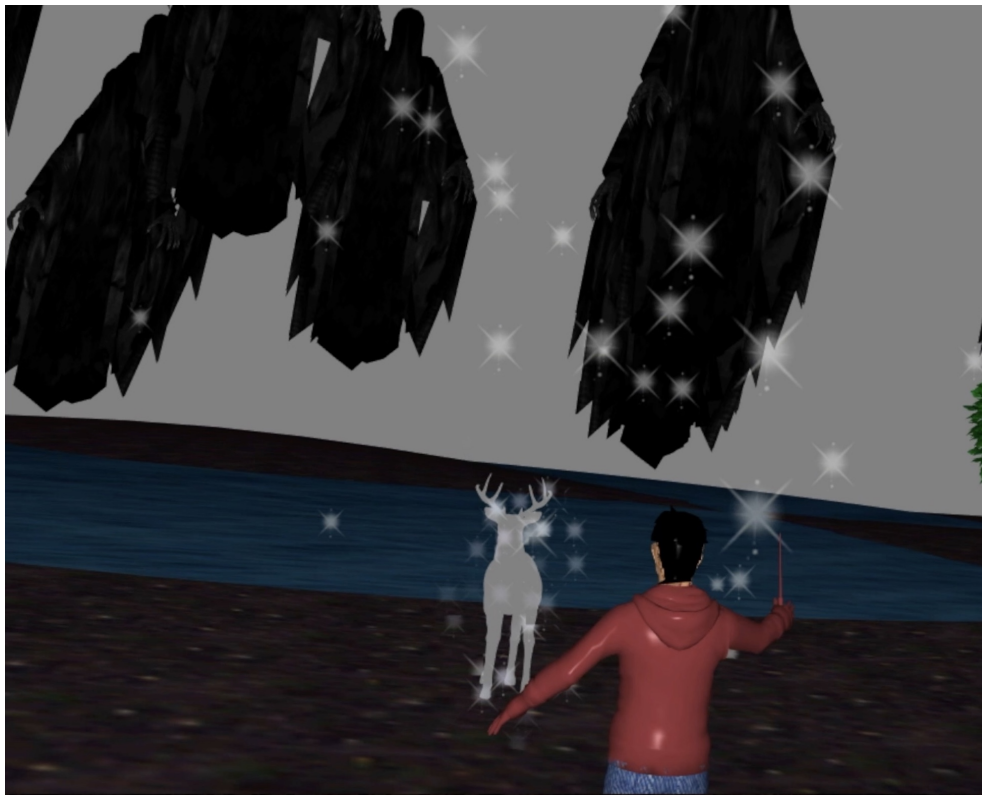


Figure 1: Preview of the scene

When the code is executed, we can only see the dementors and the character. The user has the ability to conjure a patronus by pressing the "E" key.

## 2 Forest

### 2.1 Ground

The forest terrain was modeled as a rectangular grid, to which we applied Perlin noise in order to create some elevation. We used a real ground photo as texture with repetition, so that the

ground is more realistic.

## 2.2 Trees

The model of a tree is divided into two parts: the trunk and leaves. We applied different textures and put the trees at random positions in the terrain. The trees are set much larger than the characters.



Figure 2: The model of tree

## 2.3 Lake

The lake is modeled using a primitive disc, which we place slightly below the ground in order to give the impression that it is not perfectly round.

# 3 Character

Using Blender, we bisected a model of Harry Potter into several parts: the hair, the face, the upper body, the arm holding the wand, and the legs. We applied a texture on every part, and we coded the animation of the right arm as such: while the user is pressing "E", the arm is rotated along the x-axis, to give the impression that Harry is waving his wand. Moreover, a sort of mist is emitted from the tip of the wand. This mist is represented by particle billboards to which we apply the desired texture. We suppose that they are subject to the force of gravity, and we find their position accordingly.

# 4 Patronus

To model the Patronus, we imported a model of a stag, and we decreased its opacity to augment the sense of spirit and of mystery. What's more, we generated randomly some shiny particles

around the Patronus. We animate them along the normal of the mesh while decreasing their opacity with time, and remove them within 3 seconds.



Figure 3: Patronus

## 5 Dementors

The dementors were modeled using an imported mesh object and a special texture, and were placed at random locations in the scene. To animate them, we assign a random starting time for each one, and their position along the y-axis varies periodically.



Figure 4: A Dementor

## 6 Animations

The main animation of the scene happens when the user presses "E". Harry's right arm gets rotated around the x-axis, particles get emitted from the wand, and the stag appears with sparkles around it. Also, the dementors, which gradually move towards Harry in the beginning, get carried away in the presence of the patronus.

## 7 Limitations and Future Improvement

If we had more time, we would have applied the cloth simulation methods seen in the lectures to the dementors, especially the wind force. When we tried to do it, we faced some challenges: it was hard to implement the spring forces between the cloth particles all while maintaining a rather complicated shape.

We could also use fluid animation for the water body, or even for the particles emitted from the wand, so that it looks more like mist and less like individual particles.

A video of the animation can be found in the main folder of the project (**video.mp4**).