

Concordia University
COMP 471 / CART 498 C – Fall 2006

Computer Graphics

Assignment 2 --- Due October 23, 2006

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Name of the project : Crossing the river.

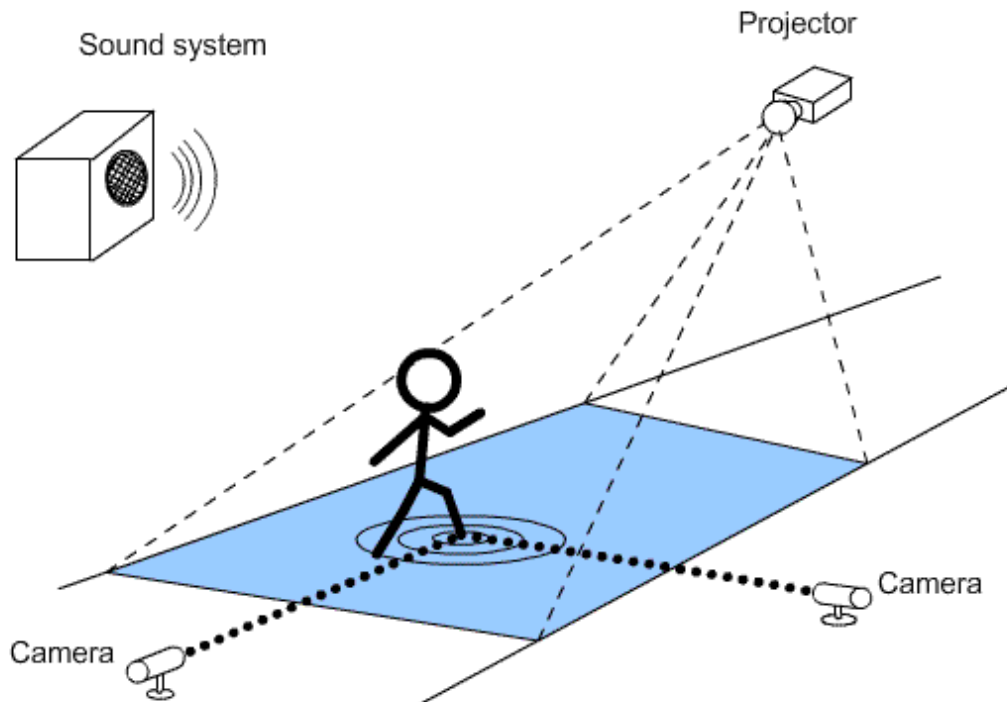
People :

We are two exchange students from France, we belong to an engineer school in Nice (in the computer science department) and we decided to do our last year in Concordia in order to attend other kind of courses and more particularly computer graphics oriented ones.

What is it :

Generate a realistic water effect on the ground which would react as people walking above it. This project is splitted in three main tough parts :

- At first we need to project the water live video on the ground producing the effect that a fluid covers it.
- Then we have to compute the position of something hitting the ground into a defined perimeter which matches the one where we are projecting the video.
- Finally we need to implement a function (which should be at first sight an OpenGL one) to create the water surface and then the effect that a wave is spreading through it.



Roles :

The first two steps to achieve would be the projection and the movement tracking which can be easily done individually. Then the first of us who would have fulfilled his task could start working on the water texture synthesis.

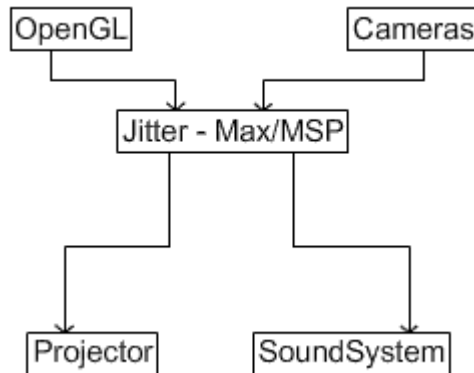
What is the project asking or exploring ?

Technically speaking this project involves strong mathematical programming and physical modeling.

- On the one hand mathematics content would refer to edge detection by ensuring that a wave is generated not only at the right place but also if and only if something hit the ground on the water texture.
- On the other hand we will need to understand and then model a realistic effect of spreading waves (eventually interacting with each others) which should be quite difficult.

Our application must take place where people are using to pass without stopping such as metro corridors or malls hall. Nevertheless such an application could only enable few people to interact with it. Moreover it doesn't require artistic sense or the whole attention of the audience to be appreciated. In fact it just consists in entertaining people for a short moment in a common place where they are used to walk

Here is the software architecture of our application :



OpenGL generates the water texture while cameras give hitting point coordinates on the texture, then the group Jitter – Max/MSP computes those informations to render the wave effects on the texture and also the sound.

Milestones / Timetable :

Projecting the video (including basic Jitter effects of wave spreading) and edge detection should be done in priority in the same time. A first big milestone would be reached when it would be done.

Then we will focus on improving the wave effect with OpenGL or other advanced Jitter programming.

Deliverable :

Ideally in the EV building, on the lillte bridge above the escalators which lead to the metro station.



Ressources needed :

We are currently thinking about what we actually need. As we have to compute three dimensional informations about objects to know when and where they hit the ground, we will probably need two cameras. Also as we have a texture to project we will need at least one projector and a mean to attenuate the shadow caused by the lighth of the projector (another projector or a spot light...). As we want to create a special atmosphere around this installation we should add sound processing using MSP which involves to have speakers.

References :

- http://www.topologicalmedialab.net/xinwei/classes/cs/COMP471_ComputerGraphics_RealtimeVideo/index.html
- http://www.cs.concordia.ca/~comp6761_2/