

Project #	Project Name	Project Track	Project Family
11301	Water Falls Media	Autonomous Systems and Controls	None
Start Term	Team Guide	Project Sponsor	Doc. Revision
2010-1	George Slack	Marla K. Schweppe	1

Project Description

Project Background:

This project was inspired by Marla K. Schweppe and the College of Imaging Arts and Sciences . The project will be a hybrid between projection displays and artificial waterfall displays. The engineering design team will design and build an apparatus that can easily be configured with a projector to display the desired images by the customer.

Problem Statement:

The idea for this project is to design a display waterfall that gives the operator the ability to modify the way the water flows and also to control a projector to project images onto the waterfall. The liquid used needs to be translucent enough to be easily projected upon. The machine must also be able to be completely self contained and portable. The water sheet size must also be large enough and proportioned correctly to accommodate the display of the projector.

Objectives/Scope:

1. The main objective is to create a large enough waterfall (7-10 feet wide) to be used effectively as a screen for a 16:9 projected image in a safe, self-contained, and portable system.
2. The user will have a way of controlling the waterfall by restricting segments of it, allowing for various effects.
3. The user will have an effective means of controlling the waterfall, via a Python library.

Deliverables:

- A self-contained, apparatus capable of producing an aesthetically pleasing laminar waterfall between 7 and 10 feet wide, onto which a 16:9 image can be projected using a suitable projector.
- The ability to turn segments of the waterfall on and off in order to achieve various effects, and an appropriate interface to allow the user to control this function.

Expected Project Benefits:

- The project will provide an attractive, novel means of displaying projected images, utilizing a controllable laminar waterfall.
- The unit will be large enough to be effective, yet self-contained and able to be used in different locations.
- A user with a basic understanding of Python programming will be able to take advantage of the ability to cut off segments of the waterfall, allowing for various creative water effects in conjunction with the projected presentation.

Core Team Members:

- Michael DeMayo (Project [admin] Manager)
- David Watkins (Design Manager)
- Ben Sheron
- John Matthews

Strategy & Approach

Assumptions & Constraints:

1. Laminar flow must be maintained as much as possible during the water free fall.

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2. Translucent liquid must be applied to provide a better projection surface.
3. Electric pumps will be used to move the water from the catch basin to the pouring trough.
4. The water fall sheet must have an aspect ratio of 16:9 in order to match the aspect ratio of the projector.
5. A standard 2500 or 6000 Lumin projector will be used to project onto the water fall sheet.

Issues & Risks:

- Minimizing turbulence in the water flow to the degree that it is usable as a projection screen will be difficult.
- Water on its own may be too translucent for use as a screen in most lighting conditions.
- For example
 - The lead time of component ABC is 10 weeks.
 - The casting process has been shown over the last two projects to be one of the greatest challenges and will be a key technical hurdle to overcome for the success of the project.
 - No one on the team has a strong fluid mechanics background so analysis of the flow in subsystem EFG will require external consultation.