

## Milestone 1 – Project Proposal

### Problem

Visual languages use pictures or icons to represent a concept. By placing these icons in a spatial arrangement, visual sentences can be created. These sentences represent patterns and have many uses. For example, universal icons can be used by people with disabilities to communicate, or two people who speak different languages can use them to communicate.

The problem that this project will seek to solve is that of searching for videos using a visual language. While the program I will create will be a simple web application, this could be extended as a mobile or tablet app and used by someone who is unable to type a query.

In addition to being helpful in this way, this project will also serve as a preliminary exploration of visual languages and how they can be used to query other information.

### Context

While this problem would be best solved using a large number of icons that could be customized for the user and possibly span a variety of different domains, the scope will be scaled back to more focused domain and a small set of icons. They will be divided into three groups, and include (at least) icons that represent the following:

<i>Nouns:</i>	<i>Verbs:</i>	<i>Emotions:</i>
Man	Dance	Funny
Woman	Sing	Sad
Child	Play	Romantic
Dog	Sleep	Serious
Cat	Cry	Cute
Baby		

With these icons, the domain is meant to be the very simple, fun videos that people often search for on YouTube (ex. Cute cats playing). Any combination of the above icons will be able to be accepted as queries to the system. Icons will be as basic and universal as possible and created using a simple drawing program.

These icons can be combined in a variety of ways in order to query for YouTube videos. YouTube is being used since it is easily accessible and up-to-date. Searching YouTube is something that many people do daily, and accessibility might be improved using icons to represent concepts.

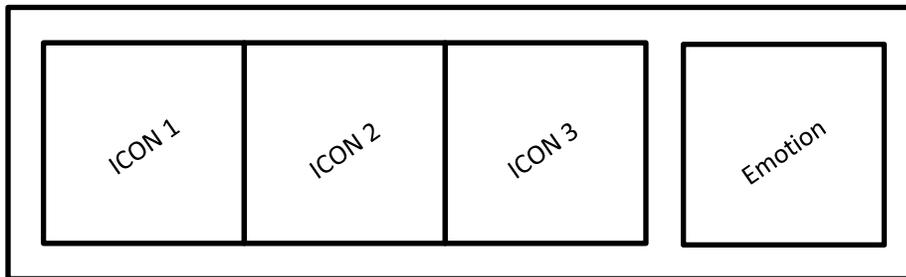
The application will be web-based, naturally, since YouTube is an online application and we want to use the most up-to-date version to search.

## Solution

For my final project, I will be implementing a simple interface for querying for videos using icons. A small set of icons will be used, and they will fall into three categories: nouns, verbs, and emotions. The interface will have two sections, one for icons from nouns and verbs, and one for a special emotion icon. The first section is meant to describe the video, while the emotion icon is a special section that is meant to describe the “type” or feeling of the video that the user is looking for. The interface will look similar to Figure 1. It will also include a basic button that will be used to submit the query. The query will then be translated into English and used to search YouTube.

Noun and verb icons (up to three) can be combined in the first section to produce a concept that the user is searching for. The order of the icons will be roughly used in order to apply semantic roles to the nouns (subject, object, etc). A Subject-Object-Verb word order will be assumed. For example, combining the icons Woman + Sing + Baby could be translated into “Woman singing to baby”. I am hoping to use some NLP tools available to the web to evaluate the probability of different combinations of the words and choose the most likely one.

Figure 1. Sketch of Interface



## Experiment

In order to test whether this interface is intuitive to anyone other than me, I will be running a small experiment with a couple of people to get their feelings about the system. I will begin by giving each participant a couple of short queries and see if they can create them using the icons, to observe how they use the icons. Then, I will let them create their own visual sentences and rate the “translation” of the query as created by my application. For each query that the participant makes, I will ask them to rate the relevance of the videos returned by counting how many videos appear on the first page of results that they believe to be acceptable responses to the query.