

RocConf Project Proposal

University of Rochester

Group Name: **RocConf**

CSC212/412 Human Computer Interaction

Final Project Proposal rev. 2.0

October 26th, 2015

Name	Department	Email	Role	Skills
Jeffery White	MS CSC	jwhite37@ur.rochester.edu	Developer/Project Manager	HTML, CSS, C/C++, JavaScript, Python, Database Design, Graphic Design
Renan Zanelatto	MS CSC	rzanelat@ur.rochester.edu	Frontend Developer/Designer	C/C++ , HTML, CSS, JavaScript, and Python
Zhiming Chen	BA CSC	zchen36@u.rochester.edu	Developer	Java, C, Database Design, SQL
Yue(Bella) Wang	MS CSC	ywang214@ur.rochester.edu	Developer	Java, python, C, HTML, CSS, JavaScript
Ye(Eric) Wang	BS CSC	ywang139@u.rochester.edu	Developer	Java,C,HTML
Jiaming(Vincent) Su	MS CSC	jsu11@ur.rochester.edu	Developer	C/C++, HTML, Javascript

Problem Statement

The use of video conferencing software has become quite common in many different aspects of people's lives, from professional interactions to personal interactions and everything in between. This has allowed for connectivity and the exchange of information over distances not possible before hand. With this connection and sharing of information also comes an opportunity to extend the possibilities of software such as Skype, Zoom, and other

communication tools. In addition to just interacting and sharing information with other users, what if it were possible to get automated feedback on a conversation? For example in a business interaction case:

Let us now imagine the case for Alice, a sales representative who videoconferences with 15 clients every week. During the last few months, Alice has barely succeeded in achieving her sales quota. Thus, she has been considering methods to increase her sales performance. She decides to try using our system to get more quantitative data on her nonverbal behavior during videoconference sessions. Several sessions later, she observes a pattern from her conversations: There is a strong correlation in smiling more and modulating volume with calls that convert to sales. She also notices that her quantified nonverbal behaviors are distinctly different in the morning than in the afternoon. In looking back, she hypothesizes that her drowsiness after eating lunch may be the reason for this difference. With these analysis results in mind, Alice is able to formulate a plan to improve the quality of her afternoon meetings and produce more sales. (rocConf scenario example)

As you can see such information could be quite useful to a user of video conferencing software in order to improve their own speaking ability and the effectiveness of their presentations over time.

Solution

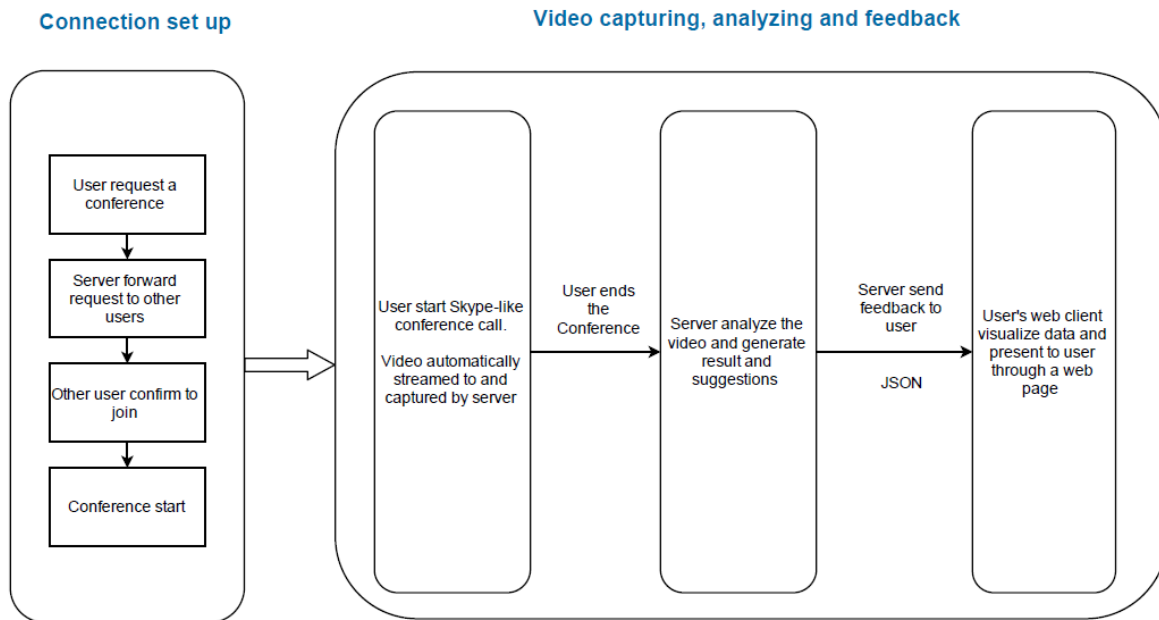
The software that can sit as an intermediary between two conferencing users already exists through the ROC HCI lab. We will be in contact with Professor Hoque and RuJie Zhao with the HCI group in order to facilitate development of a stable prototype. This software allows for the capture of Video and Audio data between two client machines and the analysis of such information. Our proposal for this project is to handle several elements of design and analysis in order to obtain an effective tool that could be integrated into video conferencing software. Our goal is to create a clean interface that can display to a user many different metrics for a conversation, either after the meeting or even potentially in real time. This interface should be as intuitive as possible, conferencing software such as Skype remains well within the domain of novice users, and we hope to keep such a feedback system in this same domain.

Requirements

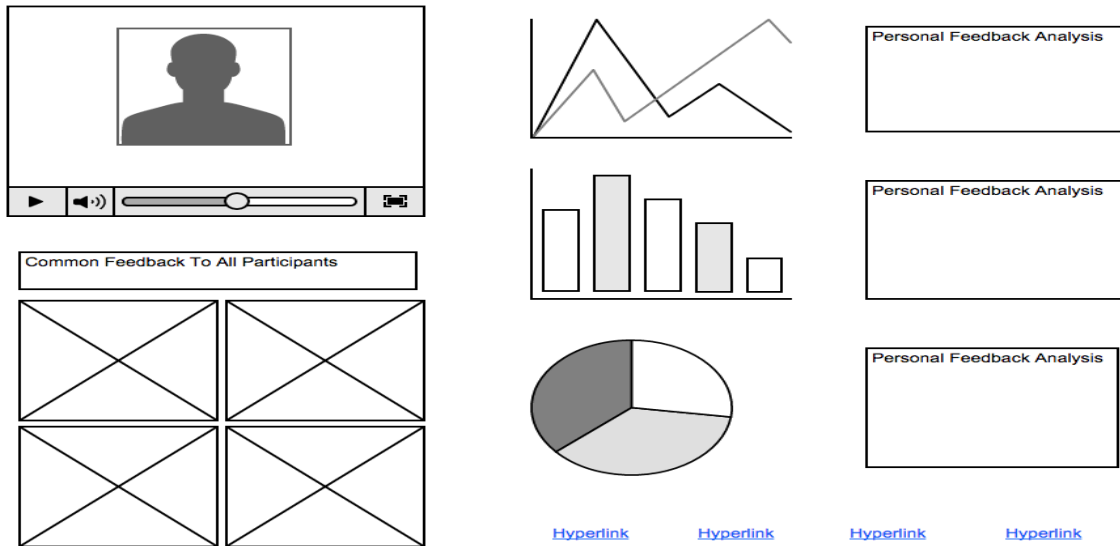
- **User Interface** - Design and Implementation of a Web Based interface for display of feedback, along with integrating some of the standard features found in conferencing software.
- **Feedback Schema** - A listing of public and private information that can be displayed to users of the system.
- **Feedback Generation** - Analysis of the Video and Audio data captured by the intermediary system to fill in the display schema. Some of this is done, although there is a possibility for extending the analysis if necessary.

- **User Study** - Design and implementation of a user study to determine the effectiveness of the prototype.

Proposed Architecture



Proposed Initial Interface Sketch



Methodology

Need Finding

There are two tools we can use early on to get an idea of what types of information users of conferencing software would want to see.

We propose to conduct some interviews (5 - 10 in total) of people who utilize video conferences, hopefully with a good portion of this group being expert users. We'll be interested to know what types of features does a user who frequently initiates a conference want to be able to review afterwards. This particular case can apply to one on one and also one to many conferences, although we will focus our prototype on one on one calls.

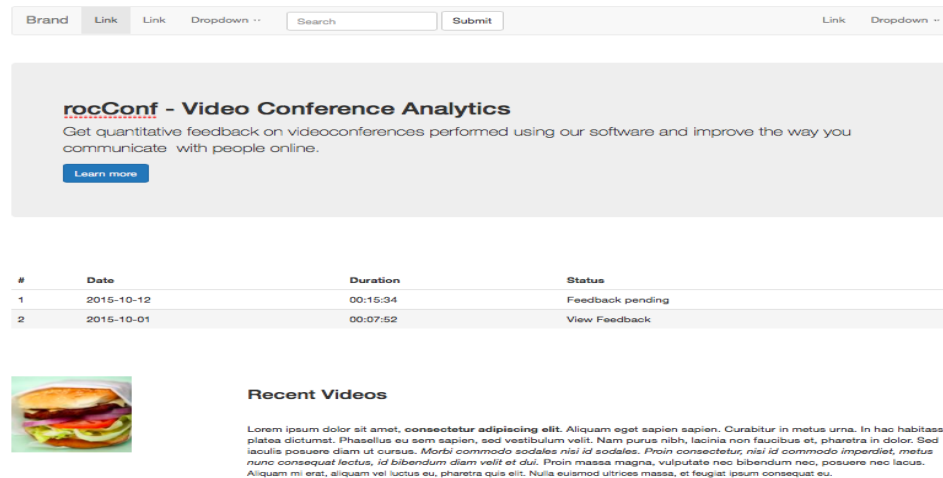
Secondly we propose to initiate a short survey of users of conferencing software. Here we can focus on the comfort level of users with the publicity of certain types of information to the other users of conferencing software. One possible approach here is to focus on users comfort level with the use of their web camera data.

Analysis of the results above will inform on the creation of the feedback schema, in order to determine what types of information should be available and the privacy level of that information.

Interface

A widely used framework for web interfaces development is the Twitter Bootstrap which has several HTML, CSS and JS components ready to use as well as a user-friendly grid system that makes any website stylish. There are a considerable number of webapps offering the service of web interface building using Bootstrap's elements but in a drag and drop fashion what reduces significantly the effort to make a high fidelity prototype and test our concept product.

For instance, using <http://layoutit.com>, In a few clicks one can easily create a landing page that looks like this:



System Implementation

This prototype is based on a tool (C#) developed by the ROC HCI group. Most of the video and audio capture as well as analysis functionalities are present in this software. Therefore, the backend development in this project will mostly be a integration platform to improve the user experience in that system.

The current software is able to:

- Connect two people to a video conferencing session.
- Record Video and Audio of those sessions.
- Perform basic analysis of these sessions.

Each video and audio segment is currently limited to 2 minutes in duration. The server side of this application merges the two and creates an output JSON dataset with various analysis elements. This includes word frequency counting as well as mood meter type analysis that is also seen in the RocSpeak application.

In this prototype, not only will we consider front end aspects, but also the backend implementation. The interface is quite straightforward to implement as long as the right tools are used in the wireframe prototype. The backend, on the other hand, needs to accomplish a few different tasks. The first is to implement the interface functionalities backing up the app's front end. Secondly, it needs to integrate the video and audio analysis capabilities of the intermediary software with the app.

There are some challenges in the backend development. The webapp will be developed in Python with a web framework library such as Flask, while all the core video conference and analysis softwares are written in C#. The use of a JSON file as an intermediary between these

two applications will make integration much easier and we should not at this point need to sink a lot of time into database development to produce a working prototype.

Feedback Visualization

A number of software packages exist for assisting with the display of graphical feedback data, so we'll be exploring these options for use in the interface. The decision of which to use will be based on which would integrate smoothly with both the backend analysis software and the interface software. In addition we'll need to determine which of the following packages offers the graphing and graphics display information that will best fit the results of our need finding study.



Dygraphs

Dygraphs is an open-source JavaScript charting library for handling huge data sets. It's fast, flexible and highly customizable. It works in all major browsers (including IE8) and has an active community. Dygraphs has defined a niche use-case for itself and won't be the perfect solution for all your needs. But it will work for you more often than not whenever you are handling large datasets.

FusionCharts

FusionCharts has probably the most exhaustive collection of charts and maps. With over 90+ chart types and 965 maps, you'll find everything that you need right out of the box. It not only supports modern browsers, but also older browsers starting from IE 6.

FusionCharts supports both JSON and XML data formats, and you can export charts in PNG, JPEG, SVG or PDF. They have a nice collection of business dashboards and live demos for inspiration.

Highcharts

Highcharts is another big player in the charting space. Like FusionCharts, it also offers a diverse range of charts and maps right out of the box. Other than normal charts, it also offers a different package for stock charts called Highstock which is also feature rich.

It allows exporting charts in PNG, JPG, SVG and PDF. You can view the various chart types it offers in the demo section. Highcharts is free for non-commercial and personal use, but you will have to buy a licence for deploying it in commercial applications.

Chart.js

Chart.js is a tiny open source library that supports just six chart types: line, bar, radar, polar, pie and doughnut. But the reason I like it is that sometimes that's all the charts one needs for a project. If the application is big and complex libraries like Google Charts and FusionCharts makes sense, otherwise for small hobby projects Chart.js is the perfect solution.

It uses HTML5 canvas element for rendering charts. All the charts are responsive and use flat design. It is one of the most popular open-source charting libraries to emerge recently.

Infogram

Infogram enables you to create both charts and infographics online. It has a restricted free version and two paid options which include features like 200+ maps, private sharing and icons library etc.

It comes with an easy to use interface and its basic charts are well designed. One feature that I didn't like is the huge logo that you get when you try to embed interactive charts into your webpage (in free version). It will be better if they can make it like the little text that Datawrapper uses.

Plotly

Plotly is a web based data analysis and graphing tool. It supports a good collection of chart types with built in social sharing features. The charts and graph types available have a professional look and feel. Creating a chart is just a matter of loading in your information and customizing the layout, axes, notes and legend.

Amcharts

_____Amcharts is another javascript library for creating dynamic charts. The ROC HCI group has made frequent use of this software so this becomes an appealing solution. Having those resources to lean on can help speed along development of a working prototype.

System Evaluation

At this early stage we're looking at setting up some user studies (combination of survey and interviews of users) of the final prototype. There are some scenarios that can be explored by this tool:

- Users are asked to give feedback about their own performance in the video conference and then these results are compared with the automated feedback.
- Users are asked to give feedback about other person's performance in the conference. The results are compared with the automated feedback.
- Users can be asked one speech improvement he or she can think of based on the conference right after its end. Then, another group of users receive a machine feedback about their speech and the usefulness of the feedback vs self-assessment is measured qualitatively.

Setback Potential

There are a number of different ways this project could hit some sort of setback in development, mostly because there are so many variables that can be measured and displayed to users. Ultimately we'd like to keep the main focus on the User Interface design, which is the reason for doing 2 rounds of rapid prototyping for it.

Our plan to handle setbacks in development of the user interface will involve determining from the need finding which of the analysis features are the most important to users and start with implementing those first. In this way if our group ends up hitting a time barrier we can still have a working prototype, instead it will be slightly scaled back in features.

Another possible setback here is smoothly integrating the data into the user interface. Depending on our determined features and visualization some of this data could be non existent or difficult to fit into the design. There are two ways one can approach this, one is to throw out these design elements, another is to fill in the data gaps and produce the interface. In the second option you could get a novel interface design that can inform on the needs that the analysis software should try to target.

Project Timeline

Group Meetings - Fridays 5:30 PM in Carlson Library.

Meeting with Professor Hoque - Mondays after class each week.

		Weeks					
#	Task	18-Oct	25-Oct	1-Nov	8-Nov	15-Nov	22-Nov
1	Project Proposal						
2	Concept Video						
3	Needfinding Survey						
4	Prototypes (Paper + Wireframe)						
5	Backend development						
6	Integration (Backend + Front End)						
7	User tests						
8	Demo Video + Poster						

- **Concept Video and Proposal**
 - Target Date: October 25th, 2015
 - Group Members: All
- **Need Finding**
 - Target Date: October 31st, 2015
 - Group Members: Bella, Jeff, Zhiming
- **Paper Prototype**
 - Target Date: November 6th, 2015
 - Group Members: Vincent, Eric, Zhiming
- **Interactive Wireframe**
 - Target Date: November 9th, 2015
 - Group Members: Bella, Zhiming
- **Backend Analysis and Output**
 - Target Date: November 14th, 2015

- Group Members: Jeff, Eric, Vincent
- **Interface Prototype**
 - Target Date: November 23rd, 2015
 - Group Members: Renan, Bella, Jeff
- **User Testing**
 - Target Date: November 30th, 2015
 - Group Members: All
- **Demo Video and Presentation**
 - Target Date: December 2nd, 2015
 - Group Members: All

#Concept Video Outline

- Concept is to show a 'rough' video conference with negative reactions.
- First Slides - "Everybody has that boss they wish could review their own work after a conference."
- Spliced in Video Conference with subtitles of a not so happy boss. This particular iteration involves a spliced conference with Vladimir Putin cancelling christmas for his staff, and they are not very happy with this result.
- Slide - "Introducing RocConf, software that can let you review and analyze your video conferences!"
- Move to slides of the proposed interface with a person reviewing afterwards, so reviewing the word frequency, graphs of the participants and so on.

<https://drive.google.com/file/d/0B1ATnpk7xn2-QXg0amNQRTRpTHc/view?usp=sharing>