



CSCI3280 Introduction to Multimedia System, 2016 spring

Course Project Specification

P2P Karaoke System

Due Date: 6 April, 2016

Late penalty: 10% per day

Phase Two: A Peer-to-Peer System

Introduction (Phase Two)

For the phase two, the peer-to-peer part, you are required to enhance your program in phase 1. Based on the element in phase 1, you need to add peer-to-peer features into your program. Your program shall be able to do network searching, and video streaming. Again, your program will be tested on Windows platform.

Basic Requirements (Phase Two)

1. Network connection

Your program must be able to connect to other PC (node) via the network. You can use any method to get the IP address of the PC except hard coding (e.g. manually input IP address, tracker server, or broadcasting). The whole network should at least has 3 nodes.

2. Video searching

In addition of the local video searching, the network searching should be supported in this part. The searching interface should use the same one as those in phase 1. What's more, your program should search the video files not only in the local database, but also in the database of the other nodes that are connected to your program. All the results from both local database and network database should be combined and displayed in the same list control of the UI. Duplicate content (e.g. different nodes have the same video file) must be displayed once only.

3. Playing criteria

As user may not know where the video is, when the user selects a video from the searching results, the program should check out whether the video file exists locally or not. If the video file exists, your program shall play the video directly. Otherwise, your program will stream the video file from other nodes.



4. Real-time video streaming

When the program is doing streaming from the other nodes, your program **must automatically play** the video as soon as possible when it receives a piece of audio and video data (after certain amount of buffering). You are only allowed to buffer no more than 50% of a video data before you play the video.

5. Peer-to-Peer playing

Your program must be able to receive one video file from at least two other computers simultaneously. The video data from different computers should be played in an interleaving way. For example, suppose PC1 wants to play a file and it cannot be found locally. It should get video data from PC2 and PC3, the file is divided into (at least) 4 parts, and PC1 may get the first part from PC2, the second part from PC3, the third part from PC2, and the fourth part from PC3, etc.

To verify the interleaving feature, you should also implement a function in your project to show your interleaving feature using images. We will give you images in different colors but have the same file name in ppm format and resolution. Let say PC1 wants to download this image from other terminals in an interleaving way, you have to ensure that your data are completed but collected from different terminals. Figure 5 shows the example of interleaving feature.

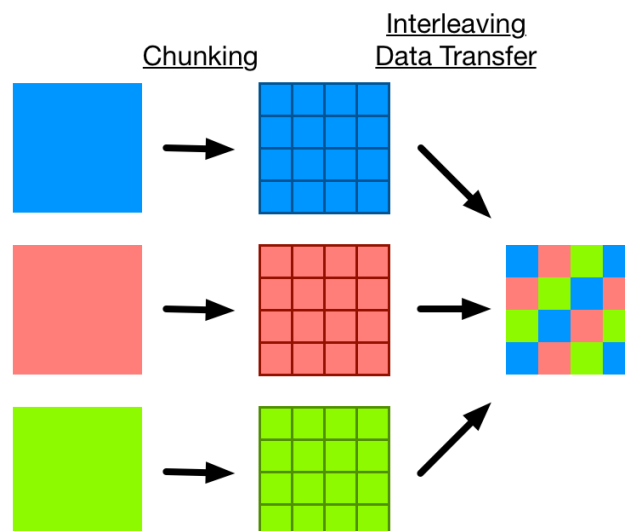


Figure 5. Example of interleaving feature

Suggested Enhanced Features (Part Two)

1. Support other video format streaming
2. Support online bullet screen
3. Support more than 3 clients
4. Support more than 2 sources
5. Any other your own ideas to enhance the system



Demonstration and Report

For this project, you need to do a demonstration of your system and submit a report for each part.

The report is a short description, about one to two pages, to describe your system. You must write down your team number, team member's name and student ID, workload division, and program's operation manual. You also need to state which third-party libraries have been used in your program, and what enhanced features you have additionally implemented.

You need to do a demonstration in front of a tutor. In the demonstration, every basic requirement that you have fulfilled and every enhanced feature that you have implemented should be introduced clearly and efficiently. Please tell tutors if you have any special requirements on the library, tools or any resources. What's more, you will only have 12 minutes to demonstrate your program and mark will be deducted if you do your demonstration is overrun.

The following the requirements are also need to be followed:

Before the demonstration

- You can use any machines, including your own PC, in the venue of demonstration. Please be well prepared before you do the demonstration (e.g., setting up your environment, downloading the necessary resources).
- Tell the tutor, if they are free, to come and get the submitted CD-R.
- You need to copy your program from the submitted CD-R to the demonstrate machine in front of the tutor.
- The demonstration starts when you run your program.

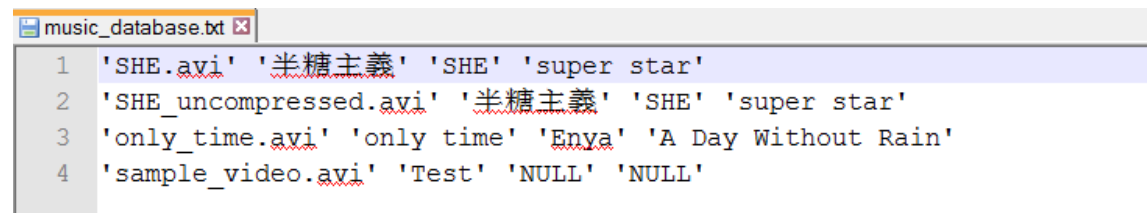
During the demonstration

- You need to demonstrate all of your program features.
- Tutors may ask you questions about your program and your answers will definitely affect the grades.
- You are not allowed to close/restart your program without permission.
- Unstable performance (e.g. BSOD, program no responses, or unexpected results) may lead to mark deduction.



Materials provided on Course web page

1. A package named “music.rar” which contains 6 files: SHE.avi, SHE_uncompressed.avi, only_time.avi, sample_video.avi, readme.txt and music_database.txt.
‘music_database.txt’ contains information of each avi files, including ‘filename’, ‘music title’, ‘singer’ and ‘Album name’, as below:



```
music_database.txt
1 'SHE.avi' '半糖主義' 'SHE' 'super star'
2 'SHE_uncompressed.avi' '半糖主義' 'SHE' 'super star'
3 'only_time.avi' 'only time' 'Enya' 'A Day Without Rain'
4 'sample_video.avi' 'Test' 'NULL' 'NULL'
```

Figure 5. music_database.txt file

2. A package named ‘interleaving_test.rar’ which contains 2 ppm format files: 1.ppm and 1_1.ppm.
These two files are offered for you to test the interleaving data transfer feature as we described in **Basic Requirements 5**.

Assessment

Basic requirements and originality:	50%
Enhanced features:	30%
Innovation:	10%
Demonstration and report:	10%

Important Dates

Project Deadline:	6 April, 2016.
Project Demonstration Time:	To be announced

Submission Guidelines

1. You are required to submit your project with CD-R and a hardcopy of report, only one for a group. The CD-R should contain your source codes, a soft copy of your report.
2. There will be an assignment box on the 10/F of SHB about 1 week before the deadline. You can submit your CD-R into that assignment box.
3. Late submission will lead to mark deduction.
4. No plagiarism is allowed. Plagiarism will lead to fail in this course.
5. All the test case avi files are downloaded from the internet for educational purpose. Those video files may be subjected to copyright. Please do not distribute them.