Smartify Music Player
User Manual

ECE 180D Team 9

Introduction

Smartify is an intelligent interactive player that plays the best smacking tunes at the right time in the right place for the users. Smartify can detect the listener's activity, mood, and gestures in order to play the most suitable songs to get the user in the groove.

Notice

The following is manual for the version of Smartify on Github as of February 5/6th, 2021. The manual is bound to change given the updates to the project.

Download and Setup

To install the player (or use it with IMU as a controller), first clone the repo from https://github.com/180D-FW-2020/Team9

You would also need to install the list of dependent python libraries. The process varies for anaconda and pip, so Dependent libraries are listed below, or on the README page of github.

If using Conda Environment:
Please use the command conda

env create -f environment.yml
or
conda env update -f environment.yml

For the current state of the Project, these are the main components:

1. *Smartify Music Player*
2. *Voice Controller*
3. *IMU controller*
4. *Emotion Detection (inside Smartify Player)*

Project Dependencies

Smartify Music Player/Voice Controller: (You want to run the Smartify Music Player)

- Python3 Download Python
- VLC Media player (requires libvlc.dll) Download VLC
  Installation is required on player device (as python-vlc depends on the dll)
- python-vlc (pip install python-vlc)
- youtube-dl (pip install youtube_dl)
- pafy (pip install pafy)
- Youtube-Search-Python (pip install youtube-search-python)

- TinyTag (pip install tinytag)
- Pandas (pip install pandas)
- Speech_Recognition (pip install SpeechRecognition)
- paho-mqtt (pip install paho-mqtt)

Emotion Detection: (You want to use “Create Emotion Playlist Function” from Smartify Player)

- Numpy (pip install numpy)
- OpenCV (pip install opencv-python), with conda (conda install opencv)
- Tensorflow (pip install tensorflow) WARNING: this library is large, and will take a lot of space!

IMPORTANT NOTE: To use Emotion_Detection Feature in the Music Player, model.h5 (tensorflow model) is required.

Link to the most recent version of model.h5 will be inside *modules/emotionDetection/EmotionDetection_README.md*

Download the model.h5, and place it in *modules/emotionDetection/model.h5*

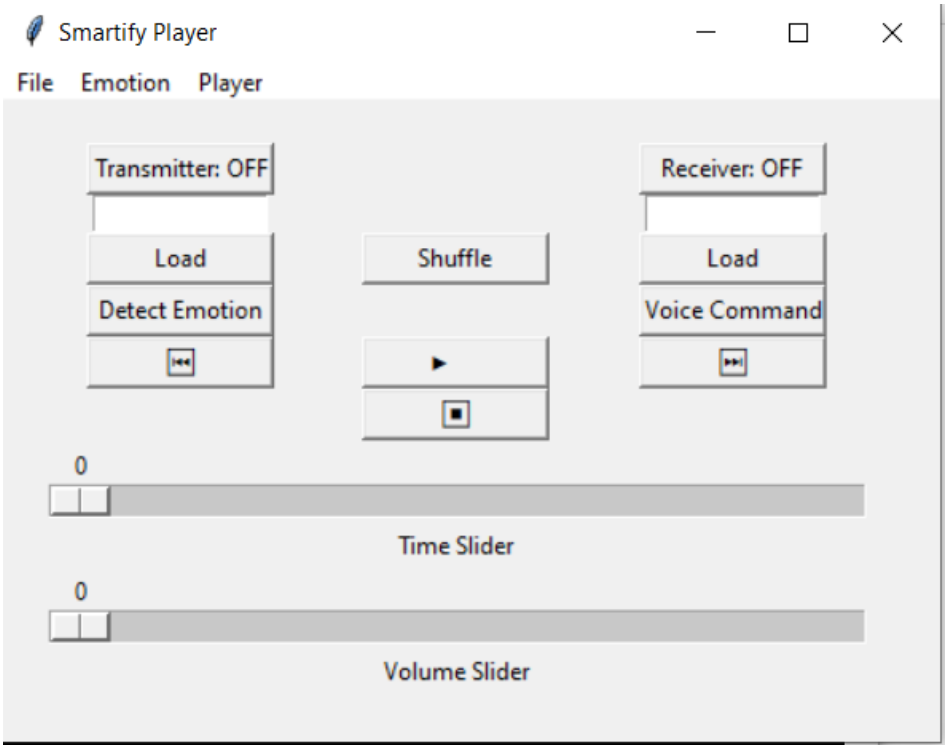
Controller (IMU): You want to use BerryIMU as your Smartify Controller

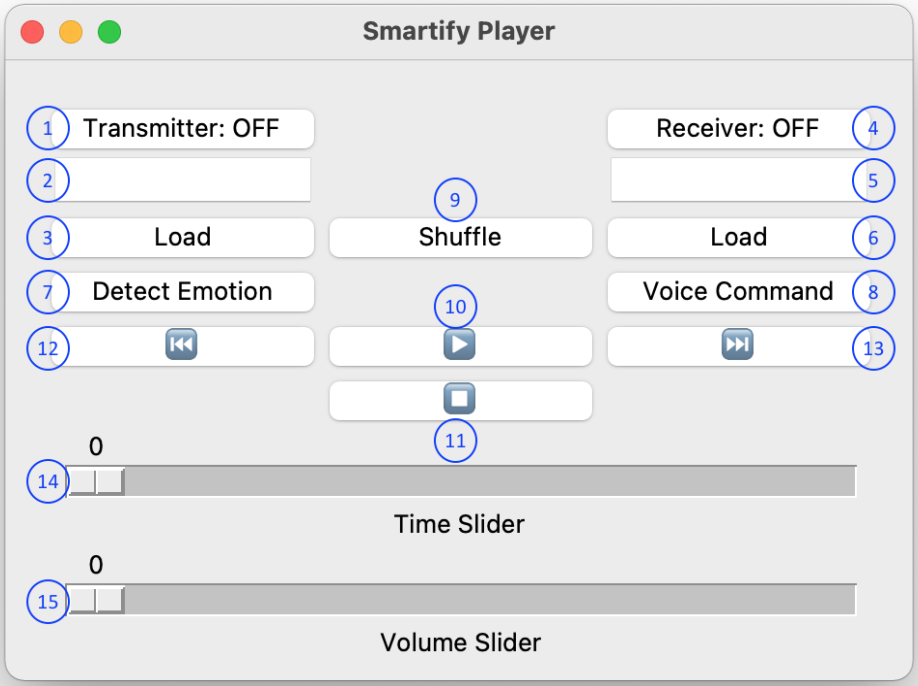
- Python3 Download Python
- paho-mqtt (pip install paho-mqtt)
- Store "modules" folder in the raspberrypi

How to Run the Modules

1) ***Smartify Music Player*** -> gui_music_player.py
   To run the player, simply run with python gui_music_player.py
2) ***IMU controller*** -> /modules/IMUControl/gesture.py
   Run with python -m IMUControl.gesture [optional_room_name] with pwd (current directory) in /modules
3) ***Voice Controller*** -> /modules/VoiceRecognition/speechRun.py
   Run with python -m VoiceRecognition.speechRun [optional_room_name] in /modules
4) ***Emotion Detection*** *module can be used directly from the Smartify Music player.*

Player Overview





1. Turn transmitter on and off switch
2. Entry to input desired transmitter channel name
3. Load specified transmitter channel
4. Turn receiver on and off switch
5. Entry to input desired receiver channel name
6. Load specified receiver channel name
7. Activate emotion detection button
8. Activate Voice Command button
9. Play random playlist button
10. Play/Pause button
11. Stop button
12. Previous song button
13. Next song button
14. Song progress bar and slider
15. Volume Slider

File:
- Add Song directory
- Clear Smatify Data

Emotion:
- Export Emotion Data
- Import Emotion Data
- Run Emotion Detection

Note: Visuals of the player may vary by OS. Current model is not the final product.

Initialize the Player

In order to play songs from your Smartify Player, you will need to do 2 things:

1. Load the directory of songs
2. Create a Playlist

Add Song Directory (Load the directory of songs)

Load your song directory by adding the parent song directory from the menu; On the menu, click “File->Add Song Directory”. All .mp3 or .wav files in the directory (or in subfolders) will be added to Smartify.

(Optional) Import/Export Emotion Data (Load directory from existing data)

If you want to use existing Smartify data to add the song directories, On the menu, click “Emotion->Import Emotion Data”. Alternatively, if you want to export your Smartify data, click

on “Emotion->Export Emotion Data”. It will be saved to the root directory of the project (where Smartify player is located as *Smartify_Data.csv*).

Smartify Data is just a simple .csv file (comma-separated-value). Changing the “emotion” field in the .csv file will allow users to customize their playlist when using the Emotion-Detection Module. (Don’t forget to import Emotion Data in this case!)

Smartify Player GUI Interface: Solouser Player

Create a Playlist

There are 2 ways to create a playlist:

1. Random Playlist (Button 9)
2. Emotion-based Playlist (Button 7)
   Read the next page for more instructions.

Playing/Pausing Songs (10-14)

Now that you loaded the songs and created a playlist, the typical Music Player buttons (Buttons 10-13) should work properly. Simply click on the command you want to use.

To skip to a timestamp you want, simply drag the time slider (Button 14) to where you desire.

Emotion Detection (7)

Emotion Detection is a feature of the Smartify music player that allows the player to recognise your current emotion and plays a playlist of songs that matches your current emotions from the preset songs labeled to that emotion.
To edit the emotion labels and add more songs to the emotions, Open the *Smartify_Data.csv.* You should see a file PATH for every song you have in your directory. Add the song artist, name, and the emotion label you would like for that song.
Emotion Labels:

0 - Angry
1 - Disgusted
2 - Fearful
3 - Happy
4 - Neutral
5 - Sad
6 - Surprised

Voice Activation (8)

If you want to input a voice command to your player, run the Voice Controller module. After a second or so, you should see a message on your screen asking you to input your voice command. Here are just some of the commands you can control Smartify with:

- Hey Smartify, “Play Let Down by Radiohead” (optional: “at 25 seconds”)
- “Pause”
- “Skip one minute”

Random Playlist (9)

Generates a shuffled playlist from the songs available from your song directory.

Motion Detection (In raspberrypi)

If you want to input a gesture command to your player, run the IMU Controller module.

Run python -m IMUControl.gesture/(receiver room) in directory modules

The motion detection allows the user to play/pause, play the next song, and play the previous song. Hold the IMU on the palm of your hands with the wired pointed up on the front top with your palms facing left(for right hand) or facing right(for left hand)

- Play/Pause: Hand motion up and back to initial position
- Next Song: Hand motion right then back to initial position
- Previous Song: Hand motion left then back to initial position

Smartify Player GUI Interface: Multiuser Player

Transmit Song (1,2,3)

If you want to open a room to share the “playlist” you are listening to right now, you first would need to create a room to transmit your playlist to. To do this, do the following:

- Enter a Room name to create a room(2) then press LOAD(3) to create the room.
- Toggle the Transmit song ON/OFF(1) to send the song you are currently listening to others who tune into your room.
- Anyone with the room name can join your room and listen in on what you are playing

Receive Song (4,5,6)

If you want to join a room to listen in to a “playlist” another user is listening to right now, you first would need to enter the room to receive from. To do this, do the following:

- Enter the Room name you want to join(5), then press LOAD(6) to enter the room

- Toggle the Receive ON/OFF(4) to ON. If the Room is being transmitted to by a user, you will be able to hear their current song. If you do not have the same song file in your current playlist, we'll just find it for you on youtube!
- As long as you have the room name, you will be able to join their room