ESL Lab 2

Youtessel

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ABSTRACT

A hand-held music player realized by a tessel-2 which connects to your youtube playlists.

TESSEL MODULES

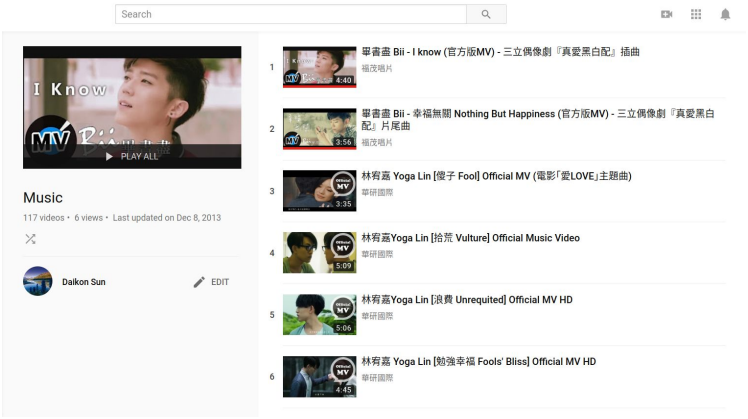
Input Modules

- RFID
- Accelerometer
- USB

Output Modules

- Audio

YOUTUBE PLAYLIST



CONTROL SCENARIO

The player starts when the RFID senses the card. The accelerometer then senses user's behavior to control the music player.

- Shake once to the right (+x): Volume up
- Shake once to the left (-x): Volume down
- Shake twice to the right (+x): Next song
- Shake twice to the left (-x): Previous song
- Shake three times to the right (+x): Next playlist
- Shake three times to the left (-x): Previous playlist
- Shake twice vertically (z): Pause/Resume
- RFID card sensed: On/Off

SYSTEM STRUCTURE

RFID: once get data: on/off the player,

Accelerometer:

- Detect user's command
    - Volume up(down)/Pause/Resume/Next(Prev): control directly
        - Detect the movement: **needReset**(), **countPeak**()
        - Use default "madplay" in Tessel with t2-compiler compiled pseudo-terminal: require('**node-pty**')
    - Next list/Prev list:
        - Crawling data from youtube list: request('**request**'), request('**cheerio**')
        - Download the music into USB: request('**ytdl-core**')
- Send data to chart-stream
    - Show the data locally through broadcast:
        - request('**chart-stream**') with "node_modules/chart-stream/public" in ".tesselinclude"

PROBLEM

We almost accomplished all we expected, except automating the whole crawl-and-download process. The debugging process and problems we encountered are described as follows.

The audio file downloaded by '**ytdl-core**' uses codec "opus". However, the default music player 'madplay' cannot decode it. Thus, we have to install 'ffmpeg' to convert to "mp3" codec. But, the image of OpenWRT used by tessel-2 chose 'mjpg_streamer' instead of 'ffmpeg'. So we have to install it by the following url: http://archive.openwrt.org/chaos_calmer/15.05/ramips/mt7620/packages/packages/ffmpeg_2.6.2-1_ramips_24kec.ipk (after recognizing the correct architecture and version). However, we found that this 'ffmpeg' cannot encode 'mp3' codec, so we select 'mp2' instead. Nevertheless, tessel-2 just does not have enough computability and RAM to do all the works (including managing all sensors, downloading and streaming data) while converting audio files. So at last, we need to convert the audio files manually before demonstration.

Photos and Screenshot

TESSEL SETUP

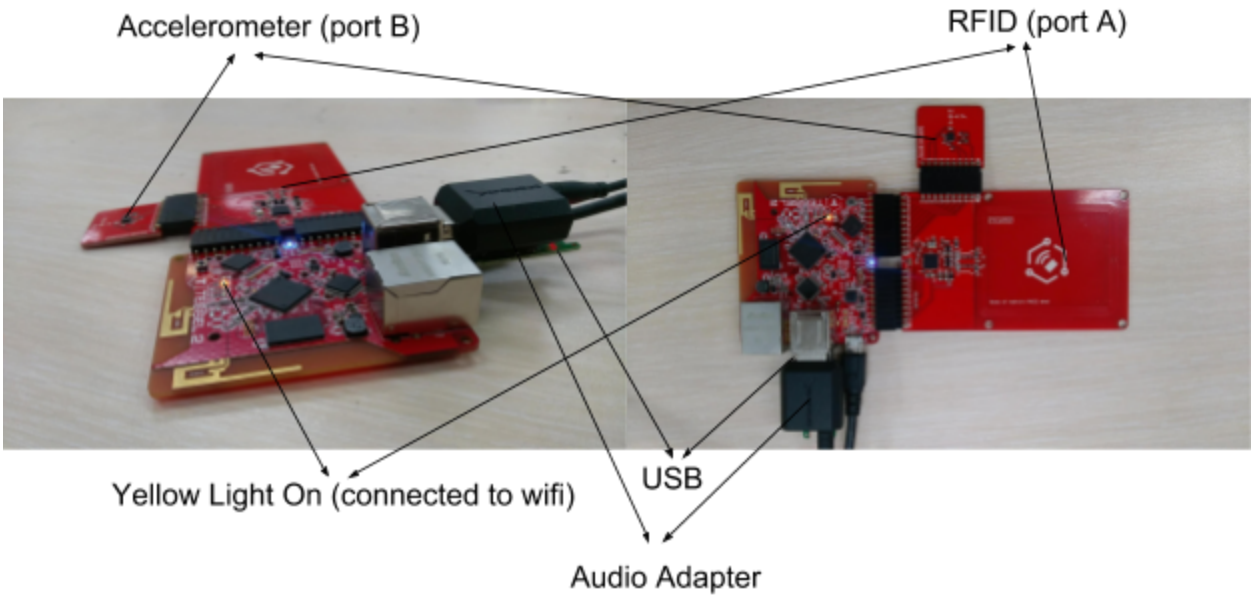
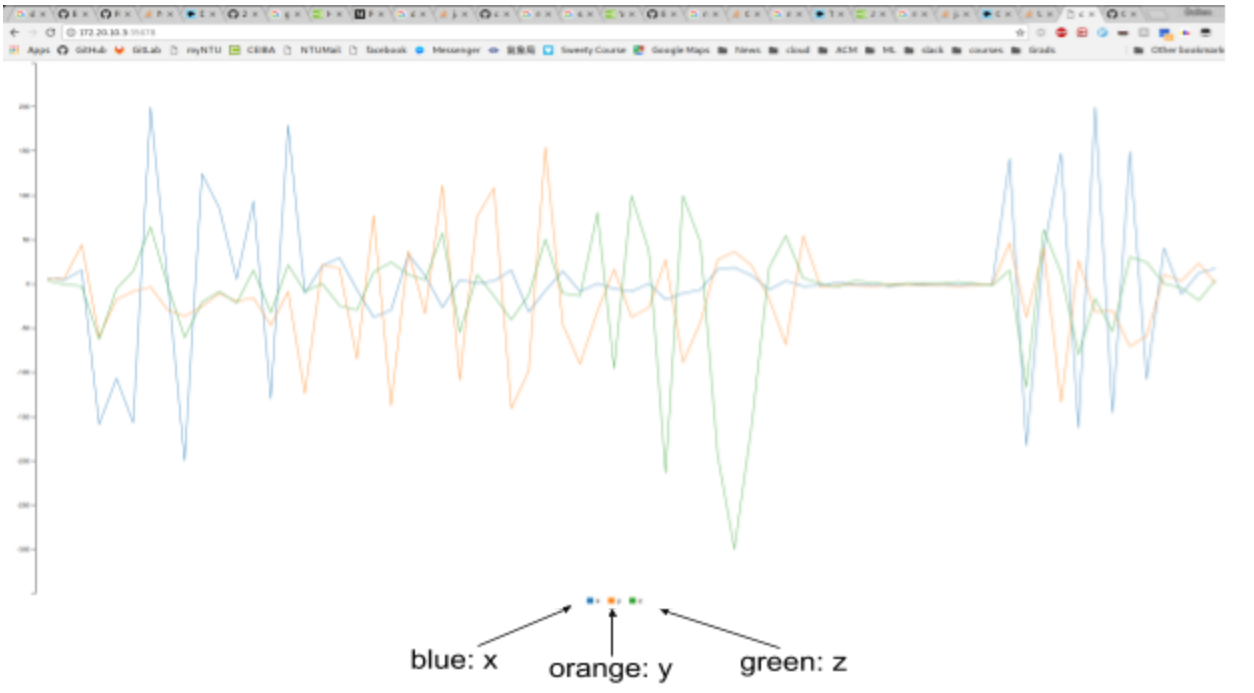


CHART-STREAM: Note that we plot (z-1) since gravity contributes directly to z+



DEMO VIDEO LINK

https://drive.google.com/open?id=1axDopUuFFjTIwUo5R4zl1pq6SVGZZPT0

WORK DISTRIBUTION

B03901063 徐一真　Crawling the data, Youtube-mp3-downloader, Report

B03901056 孫凡耕　Tessel modules, audio conversion, chart-stream, Report