NDS E-learning System

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**PROJECT DISCRIPTION**

Nowadays, the handheld game console is widely used around the world including Hong Kong. When we travel on the MTR, bus or any other type of transport, it is very common to see someone playing it. They are usually playing NDSL (Nintendo Dual Screen Lite) or PSP (Play Station Portable). These are most famous branded handheld game consoles in Hong Kong.

Many NDSL devices are also owned by university students in Hong Kong. An NDSL with a speaker, microphone, Wi-Fi (Wireless), 2 display screens with the bottom one providing a touch screen function. NDSL developed as an instant communication device. However, we think that NDSL is not just for the playing game. We think that we are able to develop a new NDSL application for it to allow it to become a portable video player. Our target is lecture video playback. Just download, and study.

**INTRODUCE**

We are wanted to enable the multimedia ability for the NDSL. Not for only for the play lecture video that provided by college or university. But also able to play back the video that encoded by user him self / herself

In this project, our aim is to develop an E-learning tool that works on an NDSL platform.

**DESIGN SPECIFICATIONS**

There are three posts in this learning system, i.e. the streaming video lecture, the notes display and real time chat room. All of the above functions are implemented by Palibs on an NDSL platform.

**Hardware**
- A computer running windows OS
- NDS
- NDS Flash card.
- NDS RAM extended card (optional)

In hardware phase, NDSL flash card is necessary to store the video file and it is must for execute our program.

**Flash Card**

**Software**
- devkitPro
- Devkit pro is a collection of libraries for NDSL development.
- palib for NDSL
- NDSL is a library that primarily provides definitions for various addresses within the NDS memory. In addition, it provides some routines to access the BIOS as well as an API to the 3D subsystem of the NDS.
- NDS Emulator
- Desmume a NDS emulator that that able to run the NDS
- Visual C++ 2005 Express Edition
- It's a Integrated development Environment for NDS development
**BLOCK DIAGRAM**

- **Xvid File**
  - Split streams
  - Audio Stream
  - Video Stream
  - Send streams to different CPU
  - ARM 7 Decode
  - ARM 9 Decode
  - Send decoded data to LCD and Speaker
  - NDS Speaker
  - NDS Display

**DESIGN PHASE**

**VIDEO CODEC**

<table>
<thead>
<tr>
<th>Name</th>
<th>Video Codec</th>
<th>Audio Codec</th>
<th>File Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xvid</td>
<td>MPEG4</td>
<td>MP3</td>
<td>.AVI</td>
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<tr>
<td>DPG</td>
<td>MPEG1</td>
<td>MP2</td>
<td>.DPG</td>
</tr>
</tbody>
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**VIDEO STREAMING**
XviD has smaller volume compared with DPG because of size and quality of the video that simulate by the simulator. The processor plays a key part, when the video file is larger, the DPG file size will also larger, if we stream the large file, speed of download and the storing will affect the quality while watching in NDSL.

However, while playing Xvid streaming file in NDS, the NDS playback time will shorter than playing DPG. It maybe caused by NDS needs more CPU power to decode. It’s a trade off process, we are able to enjoy the NDS E-learning system in any one NDS that equipped with NDS Flash card.

The Optimized format is 12 FPS (Frame per second) and 128kbps video with 64kbps mono sound AVI file

The file can be played with the NDS E-learning system while copied it to flash card.