PORTABLE DDR

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BACKGROUND AND MOTIVATION

- Dance Dance Revolution (released 1999)
  - Music video game (arcade and home systems)
  - Some limitations – pad and song choice
Novel Features

- Use of camera tracking instead of a game pad
- Song upload capability
  - Music processing
OVERVIEW: BLOCK DIAGRAM
PLAYER MOTION PROCESSING

- Determine the steps gestured by the player
- One Labkit per Camera
Music to Arrows Algorithm

- Amplitude and frequency analyses
- Step sequence stored in RAM
- “Done” signal sent to Game Logic & Synchronizer module
**Music to Arrows Algorithm**

- Figure out Beats Per Minute (BPM) for song

- $1000 \times 6$ array of registers
  - *whatever necessary for a 20-second sample of music*

- 4 registers to indicate which arrows are present

- 2 registers to identify the arrow type
  - On beat, off beat, tuplet, silent

- Reconstructed by Game Logic & Synchronizer
**MP3 Uploader**

- Controls the uploading of the mp3 file
- AC97 Audio Codec chip (LM4550)
- 8-bit audio samples
GAME LOGIC AND SYNCHRONIZER

- Integration of input signals and game control
- Main states: setup, play, end
- **Setup**: select difficulty, upload mp3, sync cameras
- **Play**: standard DDR rules
- **End**: scoring, reset to play again
VIDEO AND AUDIO OUTPUT

- Video: display scores, arrows, navigation
- Audio: read sound data from ZBT RAM and send to speakers
TIMELINE

Week:

- **11/22**
  - DK – mp3 uploader, begin game logic
  - GH – music to arrows algorithm

- **11/29**
  - DK – game logic, video and audio
  - GH – camera processing

- **12/6**
  - DK/GH – debug and testing