Master Thesis Proposal

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Table of Content

Overview

Design
- Frontend Design
- Backend Design

Features

Implementation

Future Works

Summary
Background

Figure: Architecture of HCMP

Human Computer Music Performance (HCMP) Project
- Conductor, Scheduler
- HCMP Player
Overview

- Conductor, Scheduler
- HCMP Player
  - Especially Tailor For HCMP
  - Standalone Mode
  - Connection Mode
Software Architecture

Figure: Architecture of HCMP
Control Thread Design

GUI thread

- Classic client/server model
- Response to user action
- Update canvas based on backend response
Performer Thread Design

Performer thread

- Communicate with GUI thread via message queue
- Execute predefine command from GUI thread
- Update canvas based on backend response
- Sample API

- play - play midi message
- reset - reset all backend player’s settings to default value
- pause - store current play information
- set_position - set play position to the given parameter
Network API Support

- Fully support network control
- GUI thread will be a proxy for backend
- Sample API

  - `play_all` - indicate conductor to play
  - `stop_all` - indicate conductor to stop
  - `ready` - tell the conductor that the player is ready
  - `position` - indicate conductor to set to given position
Data Visualization

Figure: Midi data display integrated with virtual keyboard

- Map different track with color
- Map midi to note on keyboard
- Intuitive visualization effect
A Midi Score Library

Figure: HCMP player audio library

- a "Project" file to store user setting
- Manage all the user audio
- Support fetch midi from website
Implementation

- wxWidget for GUI part
- Use Serpent for backend
  - Many buildin midi message function
  - Support multi-thread
  - Fully compatible with HCMP project
Future Works

- Fully integrated with score display feature
- Integrate with Dawen Liang’s previous work
  - music database function into user audio library
Summary

- Robustness of code is first priority!
  - develop unit test for all the functional component
- a Engineering project
- a Live performance for the final defense