Symphonic Harmonics

♪ Neereja Sundaresan
♪ Surekha Muralidharan
♪ Vikram Rajkumar
♪ Wayne Chiang

Status**Update**

- ♯ Concept: Versatile, portable, and flexible music composition tool that interfaces with the Android to play and record music

- ♯ Implementation:
  - ♯ New Bluetooth module acquired and working
  - ♯ Core Arduino code written
  - ♯ Core Android code written
  - ♯ Keyboard materials finalized and acquired
  - ♯ Arduino <-> Bluetooth <-> Android working

- ♯ Testing & Experimentation:
  - ♯ Bluetooth speed and reliability
  - ♯ Android user interface speed
  - ♯ Android connection code reliability
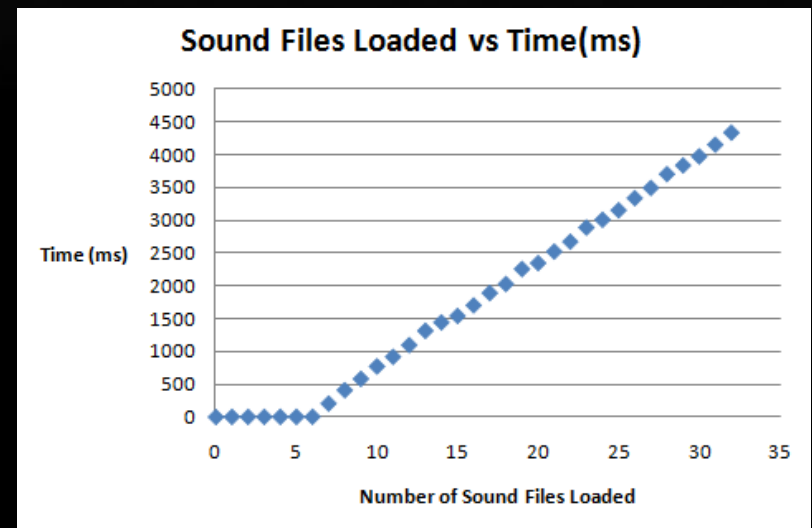 - ♯ Android playback code reliability

ExperimentationPlan

Factor	Expectation
Android application loading time	User should not wait too long for application to load
Sound file loading time	User should not wait too long while switching sounds
Bluetooth connecting time	User should not wait too long to connect to keyboard
Bluetooth packet sending time	Sounds should play as close to button presses as possible
Bluetooth disconnection behavior	User should be notified when a failure occurs with the option to attempt reconnect
Concurrent sound playback	User should be able to reliably play as many sounds as they want simultaneously
Sound switching	User should be able to reliably switch instrument sounds whenever they want

Initial Data

- ♯ Android app startup: 1061 ms (avg)

- ♯ Establishing Bluetooth connection: 3894 ms (avg)

- ♯ Receiving Bluetooth packet: ~20-60 ms

- ♯ Bluetooth disconnection: Android and Arduino both detect and alert user

- ♯ Concurrent sound playback and sound switching: Both work reliably by using Android SoundPool library

- ♯ Sound file loading time:

Looking**Forward**

♯ Lessons:

  ♯ Loading sounds and establishing a Bluetooth connection take a few seconds each

  ♯ Let user initiate these and use threading to make sure the interface doesn't freeze up

  ♯ Receiving BT packets takes some time - minimize the work we are doing when receiving

  ♯ Sound playback works fine with built-in library

  ♯ Make sure to properly disconnect the BT connection on exit

♯ Next Steps:

  ♯ Finalize beautiful interface for Android app

  ♯ Finalize casing for Arduino and related hardware

  ♯ Finish constructing keyboard

  ♯ Put it all together

  ♯ ???

  ♯ Profit!