CSCI 188 Project Proposal

Pitch Pipe for Android

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Project Abstract

The result of this project will be a virtual pitch pipe application for a T-Mobile G1 phone (HTC Dream) which runs on the Android platform. In a cappella singing, a pitch pipe is used so that every member can get the pitch of the song in their head before they start singing. It is a round instrument that the "pitch piper" turns to the right pitch slot and blows to make the sound come out. There are two ranges of pitch pipes: one for men and one for women. This project aims to produce the women's version. Thus the Pitch Pipe for Android shall have the following features:

- Selection of appropriate range of pitches by "spinning" the pitch pipe using the touch screen.
- Blowing into the microphone of the phone to activate the pitch.
- Playing the sound of the chosen pitch through the phone speaker upon blowing.
- Optional: implement the men's range of pitches.
- Optional: allow a user to keep a list of 10 songs and their appropriate starting pitches.

Strategy

The pitches will likely be kept in binary format in a file. I will be making lots of use of the android.widget package which contains most of the UI elements for developing an Android application. It also explains how to define your own widget. I will also be exploring the android.view.animation package, which provides the classes to implement simple animations. I'll likely be using the classes for tweened animation which performs simple transformations like position, size, rotation, etc…, as that will enable the "spinning" of the pitch pipe to the right position prior to blowing. For the blowing of the pitch, I plan to use/explore the android.speech package. I may also try to locate/explore the android.speech.recognition api, although that seems to have been removed from the SDK at this time. To play the actual pitch, I will be using the android.media package, which provides all the record and playback mechanisms for media. As stated above, this application will be developed specifically for the T-Mobile G1 which runs on the Android platform. The Android SDK does provide an emulator, and this emulator may be used for screen shots.

Unknowns & Problems

I'm really not familiar with any parts. I'm thinking the widgets will be similar to J2ME stuff, and I have experience with GUI development in the past, so I'm not anticipating and problems there. There is a way to define your widget layout via xml, so I will definitely look into that. I am not familiar with any kind of animation programming, but

my undergraduate degree was in mathematics, and I feel comfortable about defining rotations and other transformations in whatever way they require being defined. I am also unfamiliar with how the microphone-blowing function is going to work. If I have too many issues trying to get the "blowing" mechanism to work, I will make it a touch launch instead (spin to the right pitch, then touch the letter). I am also unfamiliar with the media package for playing back the pitch, but I don't expect this to be a large problem.

Implementation Plan

A simple list of milestones in order of how they might be completed is as follows:
Download Android SDK plug-in for Eclipse and make Hello, World (done)
Visual tasks:
>   Create/find open source graphic for pitch pipe and display on screen.
>   Implement animation – spinning the pitch pipe.
>   Hook up awareness of which pitch is at the "blow" spot. (at first print out pitch to screen)

Audio play back tasks:
>   Play back selected pitch (on touch at first?)

Audio record tasks:
>   Play back selected pitch on blowing into microphone.

The Android developer tools include an android debug bridge which provides capability for debugging in addition to the eclipse debugger.

The user interface will really just be a picture of a pitch pipe which can be rotated/spun to the indicated spot. If I get to the user being able to store songs with their pitches, then that will be a list of songs which the user can tap to play the pitch for.