Project Report

------Music game project (Beyond Spectrum)

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Arrangement:

韩宇杰：App structure, art and technique assistance.
郭含熙：View
金超：Model
蔡凯帆：Controller

Introduction

Beyond Spectrum is a music game designed to enable users to play with their own songs. It uses a beat detect algorithm to analyze .mp3 files and generate the map for playing. The generating algorithm is designed on our own. It contains some randomness such that each time a song is played there will be a different map generated. We have made some arts to the interface to make the UI beautiful. The UI in play will change it color according to a spectrum, which is related to the map. Below are the details:

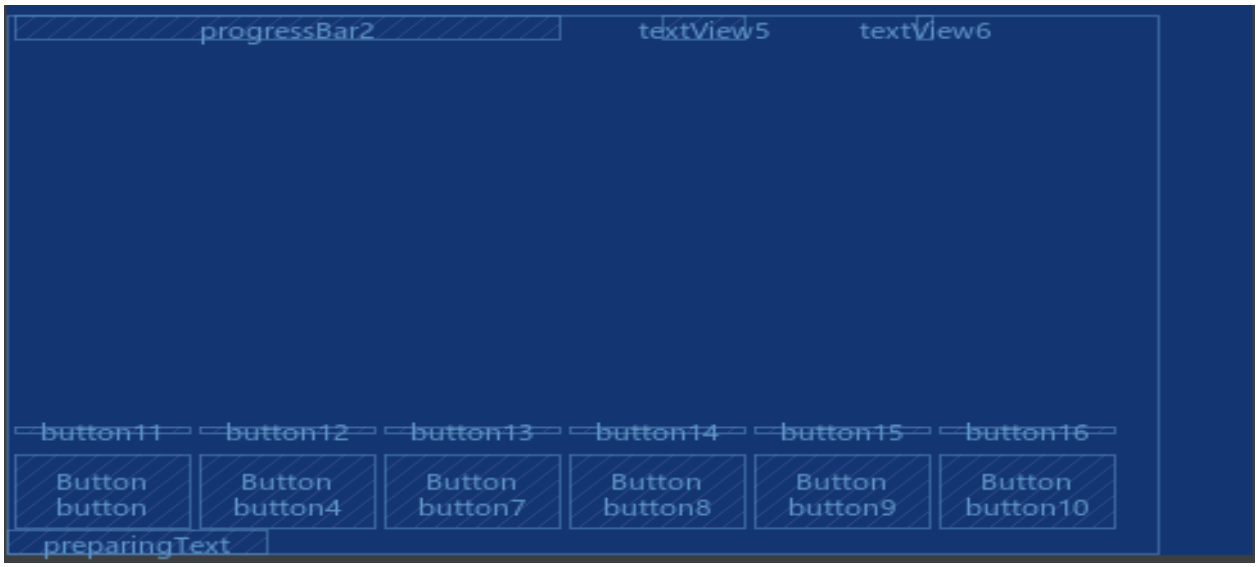
View

1. The Music-choosing View/Interface

We create a textView to show the instruction. And we use a ListView to show the information of the music to the user and use setOnItemClickListener() to determine which music that the user want to use. When user choose a music, this activity will send the information of the music to the model part of our project. We also create a setting button to let user change the basic settings of our game. Additionally, we create a separated new thread to get the information of the music. In this case, the stress of the main thread will be effectively lessened.

2.The Game View/Interface

2.1 Create The Interface



12 buttons:

Six for user's touch. When user touch these six buttons, our program will change the score. Another six buttons are for the animation. We also use several animator sets to control the displaying order of the animation.

1 progressing bar:

To show the left time.

3 textViews:

Two for the score, one for the preparing stage.

2.2 Change the color of buttons

We use setButtonColor() function, which is written by ourselves, to create a set of random gradually changing color for the buttons and change the color of those buttons.

	R	G	B	值
黑色	0	0	0	#000000
象牙黑	41	36	33	#292421
灰色	192	192	192	#C0C0C0
冷灰	128	138	135	#808A87
石板灰	112	128	105	#708069
暖灰色	128	128	105	#808069
白色	225	225	225	#FFFFFF
古董白	250	235	215	#FAEBD7
天蓝色	240	255	255	#F0FFFF
白烟	245	245	245	#F5F5F5
白杏仁	255	235	205	#FFFFCD
cornsilk	255	248	220	#FFF8DC
蛋壳色	252	230	201	#FCE6C9
花白	255	250	240	#FFFAF0
gainsboro	220	220	220	#DCDCDC
ghostWhite	248	248	255	#F8F8FF
蜜露橙	240	255	240	#F0FFF0
象牙白	250	255	240	#FAFFF0
亚麻色	250	240	230	#FAF0E6
navajoWhite	255	222	173	#FFDEAD
old lace	253	245	230	#FDF5E6
海贝壳色	255	245	238	#FFF5EE
雪白	255	250	250	#FFFAFA
红色	255	0	0	#FF0000
砖红	156	102	31	#9C661F
铬红	227	23	13	#E3170D
珊瑚色	255	127	80	#FF7F50
耐火砖红	178	34	34	#B22222
印度红	176	23	31	#B0171F
猩红	176	48	96	#B03060
粉红	255	192	203	#FFC0CB
草莓色	135	38	87	#872657
橙红色	250	128	114	#FA8072
番茄红	255	99	71	#FF6347
橘红	255	69	0	#FF4500

	R	G	B	值
黄色	255	255	0	#FFFF00
香蒲色	227	207	87	#E3CF57
镉黄	255	153	18	#FF9912
dougello	235	142	85	#EB8E55
forum gold	255	227	132	#FFE384
金黄色	255	215	0	#FFD700
黄花色	218	165	105	#DAA569
瓜色	227	168	105	#E3A869
橙色	255	97	0	#FF6100
镉橙	255	97	3	#FF6103
胡萝卜色	237	145	33	#ED9121
桔黄	255	128	0	#FF8000
淡黄色	245	222	179	#F5DEB3
棕色	128	42	42	#802A2A
半色	163	148	128	#A39480
浓黄土色	138	54	15	#8A360F
锻棕土色	135	51	36	#873324
巧克力色	210	105	30	#D2691E
肉色	255	125	64	#FF7D40
黄褐色	240	230	140	#F0E68C
玫瑰红	188	143	143	#BC8F8F
肉黄土色	199	97	20	#C76114
棕土色	115	74	18	#734A12
乌贼墨棕	94	38	18	#5E2612
秘鲁色	160	82	45	#A0522D
深土色	139	69	19	#8B4513
沙棕色	244	164	96	#F4A460
棕褐色	210	180	140	#D2B48C
蓝色	0	0	255	#0000FF
钴色	61	89	171	#3D59AB
dodger blue	30	144	255	#1E90FF
jackie blue	11	23	70	#0B1746
钴蓝	3	168	158	#03A89E
深蓝色	25	25	112	#191970
孔雀蓝	51	161	201	#33A1C9

	R	G	B	值
浅灰蓝色	176	224	230	#B0E0E6
品蓝	65	105	225	#4169E1
石板蓝	106	90	205	#6A5ACD
天蓝	135	206	235	#87CEEB
青色	0	255	255	#00FFFF
绿土	56	94	15	#385E0F
靛青	8	46	84	#082E54
碧绿色	127	255	212	#7FFFD4
青绿色	64	224	208	#40E0D0
绿色	0	255	0	#00FF00
黄绿色	127	255	0	#7FFF00
钴绿色	61	145	64	#3D9140
翡翠绿色	0	201	87	#00C957
森林绿	34	139	34	#228B22
草地绿	124	252	0	#7CFC00
酸橙绿	50	205	50	#32CD32
薄荷色	189	252	201	#BDFCC9
草绿色	107	142	35	#6B8E23
暗绿色	48	128	20	#308014
海绿色	46	139	87	#2E8B57
鲜绿色	0	255	127	#00FF7F
紫色	160	32	240	#A020F0
紫罗蓝色	138	43	226	#8A2BE2
jasoa	160	102	211	#A066D3
深紫色	153	51	250	#9933FA
淡紫色	218	112	214	#DA70D6
梅红色	221	160	221	#DDA0DD

From the list, we find that different color corresponds to different hex code, and we could transform hex code to integer numbers. Because we just want to use light colors, we first determine the range of the light colors. Then we determine the integer expression of this range. After that, we use Math. random() to create a random integer number which belongs to this range. And we can generate other random color by this random color. At last, we use setBackGroundColor() function to refresh the color of buttons.

Model

Here's the structure:

1. Decode the file

2. Fetch the data
3. Find the beats

1. We should decode the file. We use Audio Decoder jmp123 to decode the mp3 file that will be play in the game.
2. We fetch the data from the file.

We create a two-dimensional array *v* (*float v[][] = new float[b.length/4/1000+1][1000];*), change byte data into float data and save them in the array (*v[i][j] = Float.intBitsToFloat(getInt(b, index));*).

3. We find the beats. We create a new class Beat to save the time and average volume of a beat. Then we create an array of this class, use library Minim to find the beats and save them in the array.

Controller

1. To create the Game Interface, first we should create a new activity and create the java file and xml file for ready.
2. In the xml file, we can add the views which are necessary, such as button, textview, progressbar. Besides, we can use code to set the property of the view to change the place and the background of the views.
3. Create animation of the button to let it move automatically according to the tones of the song.
4. Set on click listener to set the command of the button. After click the button, the corresponding moving button will start animation to show that you have clicked the button. In this process, we have attempted many kinds of animations such as AlphaAnimation, RotateAnimation, ScaleAnimation and so on. At last, we decided to choose ScaleAnimation. What's more, it will calculate the score to show on the screen.
5. Set the property of the progressbar to show the progress of the song.