MIR - Homework2 Report

tags: `11020`

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Task1

Q1 & Q2

透過數據的觀察可以發現，如果將 Fourier Tempogram 找出的 T1, T2 x1/2 或是 x1/3 經常會有更高的分數，在 Ballroom Dataset 的 ChaCha, Rumba, Samba, Tango, Waltz 以及 ISMIR2004 Dataset 都可以明顯看出來，這也印證了上課所講的 Fourier 容易找到太快的 tempi，至於 Auto Correlation，則沒有看出太大的差別，幾乎都是用原本找到的 tempi 就能有最高的分數。

Ballroom Dataset

ChaCha		[T1, T2]	x1/2	x1/3	x2	x3
P	AC	0.468320	0.216982	0.000000	0.279188	0.000000
SCORE	FOURIER	0.000000	0.566657	0.000000	0.000000	0.000000
ALOTC	AC	0.909910	0.441441	0.000000	0.576577	0.000000
SCORE	FOURIER	0.000000	0.990991	0.000000	0.000000	0.000000

Jive		[T1, T2]	x1/2	x1/3	x2	x3
P	AC	0.443838	0.000000	0.000000	0.492166	0.008162
SCORE	FOURIER	0.363482	0.246543	0.351923	0.000000	0.000000
ALOTC	AC	0.883333	0.000000	0.000000	0.983333	0.016667
SCORE	FOURIER	0.716667	0.466667	0.716667	0.000000	0.000000

Quickstep		[T1, T2]	x1/2	x1/3	x2	x3
P	AC	0.464748	0.000000	0.000000	0.409243	0.042249
SCORE	FOURIER	0.577190	0.269285	0.056351	0.010032	0.000000

Quickstep		[T1, T2]	x1/2	x1/3	x2	x3
ALOTC	AC	0.926829	0.000000	0.000000	0.817073	0.085366
SCORE	FOURIER	0.963415	0.670732	0.134146	0.024390	0.000000

Rumba		[T1, T2]	x1/2	x1/3	x2	x3
P	AC	0.457242	0.431736	0.000000	0.024685	0.000000
SCORE	FOURIER	0.000000	0.500763	0.008673	0.000000	0.000000
ALOTC	AC	0.908163	0.867347	0.000000	0.051020	0.000000
SCORE	FOURIER	0.000000	0.948980	0.020408	0.000000	0.000000

Samba		[T1, T2]	x1/2	x1/3	x2	x3
P	AC	0.356103	0.355760	0.000000	0.127840	0.000000
SCORE	FOURIER	0.003975	0.116811	0.009881	0.000000	0.000000
ALOTC	AC	0.709302	0.709302	0.000000	0.255814	0.000000
SCORE	FOURIER	0.011628	0.313953	0.034884	0.000000	0.000000

Tango		[T1, T2]	x1/2	x1/3	x2	x3
P	AC	0.477740	0.161053	0.000000	0.224247	0.000000
SCORE	FOURIER	0.187897	0.640527	0.003355	0.011507	0.000000
ALOTC	AC	0.930233	0.325581	0.000000	0.465116	0.000000
SCORE	FOURIER	0.488372	1.000000	0.011628	0.034884	0.000000

Viennese waltz		[T1, T2]	x1/2	x1/3	x2	x3
P	AC	0.468811	0.015458	0.000000	0.285548	0.184815
SCORE	FOURIER	0.544634	0.400195	0.000000	0.000000	0.012725
ALOTC	AC	0.923077	0.030769	0.000000	0.584615	0.369231
SCORE	FOURIER	0.953846	0.907692	0.000000	0.000000	0.030769

Waltz		[T1, T2]	x1/2	x1/3	x2	x3
P	AC	0.312527	0.323150	0.044196	0.021084	0.000000
SCORE	FOURIER	0.096360	0.439658	0.063796	0.004133	0.050821
ALOTC	AC	0.627273	0.636364	0.090909	0.045455	0.000000
SCORE	FOURIER	0.200000	0.800000	0.127273	0.009091	0.100000

ISMIR2004

ISMIR2004		[T1, T2]	x1/2	x1/3	x2	x3
P	AC	0.300380	0.331798	0.022806	0.071238	0.002098
SCORE	FOURIER	0.033408	0.264829	0.044372	0.010137	0.000000
ALOTC	AC	0.602151	0.653763	0.045161	0.144086	0.004301
SCORE	FOURIER	0.070968	0.526882	0.105376	0.021505	0.000000

Q3

比較 Viennese waltz 以及 Slow waltz (Waltz) 可以發現，Slow waltz 在 win_length 大的時候會有較好的表現，Quickstep以及Tango則是都差不多，我推測如果是慢一點的曲子，比較適合用長一點的 win_length，而快板的曲子則用短的 win_length 就能有好的成果

Ballroom Dataset

ChaCha	4s	6s	8s	10s	12s
AC	0.990991	0.954955	0.918919	0.909910	0.882883
FOURIER	0.000000	0.000000	0.000000	0.000000	0.000000

Jive	4s	6s	8s	10s	12s
AC	0.983333	0.983333	0.900000	0.833333	0.733333
FOURIER	0.700000	0.683333	0.750000	0.716667	0.716667

Quickstep	4s	6s	8s	10s	12s
AC	0.951220	0.939024	0.926829	0.902439	0.841463

Quickstep	4s	6s	8s	10s	12s
FOURIER	0.951220	0.951220	0.951220	0.951220	0.951220

Rumba	4s	6s	8s	10s	12s
AC	0.877551	0.908163	0.918367	0.887755	0.877551
FOURIER	0.000000	0.000000	0.000000	0.000000	0.000000

Samba	4s	6s	8s	10s	12s
AC	0.523256	0.674419	0.709302	0.697674	0.662791
FOURIER	0.011628	0.011628	0.011628	0.011628	0.011628

Tango	4s	6s	8s	10s	12s
AC	0.976744	0.965116	0.953488	0.930233	0.918605
FOURIER	0.406977	0.430233	0.488372	0.488372	0.488372

Viennese waltz	4s	6s	8s	10s	12s
AC	0.953846	0.953846	0.938462	0.923077	0.892308
FOURIER	0.953846	0.953846	0.953846	0.953846	0.953846

Waltz	4s	6s	8s	10s	12s
AC	0.272727	0.490909	0.600000	0.663636	0.681818
FOURIER	0.163636	0.172727	0.154545	0.163636	0.145455

ISMIR2004

ISMIR2004	4s	6s	8s	10s	12s
AC	0.391398	0.529032	0.578495	0.610753	0.610753
FOURIER	0.051613	0.068817	0.075269	0.070968	0.079570

Task2

Q4 & Q5

由數據可以發現，Ballroom Dataset有很好的 performance，JCS Dataset 其次，而 ASAP 以及 SMC 最差，我認為這跟曲風有關，Ballroom Dataset 是舞曲，節奏感強烈，尤其是 ChaCha ，這種風格的曲子有明顯的節拍因此 F SCORE 較高，而 ASAP 以及 SMC 屬於古典樂，更重視曲子的架構以及旋律的優美，節奏感不是那麼強烈，因此分數較低。

Ballroom (國際標準舞曲)

Genre	f_score	Genre	f_score
ChaCha	0.902507	Samba	0.574574
Jive	0.665217	Tango	0.804018
Quickstep	0.621753	Viennese waltz	0.747253
Rumba	0.790078	Waltz	0.647616

ASAP (古典鋼琴)

Genre	midi	audio
Brahms	0.171329	-
Debussy	0.254134	0.467681
Glinka	0.178419	0.314321
Liszt	0.230304	0.367725
Prokofiev	0.254092	-

JCS (音樂劇)

f_score: 0.650760

SMC (古典樂)

f_score: 0.342015

Task3 (bonus) Q6 (didn't implement)