

# Audio beat tracking

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**Abstract** - This extended abstract details a submission to the Music Information Retrieval Evaluation eXchange in the Audio Beat tracking task. The basic idea is based on the algorithm which submitted by Daniel P.W. Ellis in MIREX 2006. We consider about the energy of beats in order to approximate the human auditory system and improve tracking accuracy.

## I. BEAT TRACKING WITH A MOVING WINDOW

In MIREX 2009, we are interested in the ability of algorithms to track beats with tempo change in a song. In order to adapt tempo change, a song is separated into two or more clips. That is, we use a moving window in certain length to estimate tempo in each windowed section. However, the shorter the window length is, the lower accuracy it will be.

Beat tracking algorithm depends on the results of tempo estimation [1]. Therefore, the beat tracking performance will be bad with the wrong tempo. If we have more information to estimate, that is, longer window size, the accuracy would be higher. Nevertheless, the window length should be short in order to estimate the tempo which varies with time. There is a trade-off between them. Finally, we choose a moving window with 15-sec length and 0.9-sec overlap.

## II. ENERGY OF BEATS

Tempo estimation algorithm generates two tempi in an audio section. The two tempi are usually implied the relationship of beats with “strong and weak” and “strong only”. In other words, beat tracking with larger tempo usually results strong and weak beats and beat tracking with smaller tempo usually results strong beats only.

In human auditory system, it tends to neglect weak beats while onset strength of weak beats is too low. An algorithm has designed for this situation and improves beat tracking accuracy.

## REFERENCES

- [1] D. Ellis. Beat tracking with dynamic programming. In MIREX 2006 Audio Beat Tracking Contest system description, 2006.