

NAO Planning Competition 2020



Cobiat Team

Members : Younis Omar and Bertè Mattia

What is sense of rhythm?

- We tried to give to our robot a sense of rhythm;
- For us rhythm means that movements follow the *bpm* of the song;
- We added a goal based on the *bpm* of the song: the algorithm has to find a sub-sequence of actions that finishes simultaneously with a beat period.

Search Algorithm

- The problem has been decompose in 7 sub-problems;
- Iterative deepening depth first search, with max depth = 5;
- At each node the actions to be performed are sorted following the duration, first the actions whose time is near to a multiple integer of the beat period and then the other;
- The difference between movements duration and integer multiple of the beat period must be less than a fixed tollerance:

$$\text{Sequence_time}(n) - m * 60 / (\text{bpm} / 4) < \text{tollerance}$$

Implementation

- We have built a matrix with the duration of each movement, in position (i, j) we have the transition time from state i to j;
- Incompatible movements have been put to $+\infty$;
- Song: “Old town road” with *bpm* = 136;

Thanks for
your
attention !

