**[TODO] FUTURE WORK**

# General

* Test dynamic fast repeat speed
* Unintended joints should not be written (=0); should written Double.NaN (don't care), and removed from control list.
* holdtime-> fluency hold; persistence hold; hold, speed -> each pose
* behavior engine -> AngleInterpolation()
* Find a day to write TR.
* Repetition seems not easy to use in co-verbal gestures; strongly restricted by speech context and synchronization.
* Activation level: when many gestures are executed in a series, high motion speed strongly effects on perception of energy.
* It is unnecessary to use too many gestures, and we should not.
* !!!!!Gesture corpus database!!!!!
* Make it useful to create robot theater.
* \*Make separate parts (head, arm, leg) able to be moved by different command.
* Script engine should check if the behavior name is correct.
* Mood should be able to be input in the script.
* !!!when the sum of HipPitch, KneePitch, and AnklePitch equals to zero,
* the upper body is upright. Small than 0 lean forward, Bigger than 0 lean backward.
* While the CoM should be computed to keep in the support polygon.
* !!! while HipRoll and AnkleRoll controls the distance between two feet.
* their sum should equal to zero, to keep the whole bottom of both feet contact the ground.
* Above did not consider HipYawPitch! It should contribute "a little" to Pitch direction.
* Pointing(old), IGGestureUp, IGGestureDown are not Pose-ti-fied.
* Text-Gesture mapping (get from Cerebella) & new behaviors
  + Request: "You can see..." "Please..."
  + BeHonest: "I..."
  + TouchForeHead
  + SwingHands
  + ShowOnSlide
  + BrushSleeve

# Specific Files

NaoClient.cs

Line 373

[TODO] perhaps, it is better to make a weight for each joint, since some joints like the Wrist can move faster.

use the rad ratio: angular speed -> line speed

Wrist: width of forearm,

Shoulder: length of upper arm

NaoMotionFramework.cs

Line 44-49

[TODO] public double SpeedFraction;

public int JointInUseNum;

Line 87 public class Stroke

[TODO] use stroke as motion unit

ComponentManager.cs

Line 43 public ComponentManager()

[TODO] make the docking more generic: search the dlls like Bert does.

BaseBehaviorProfile.cs

Line 21 using ConnectorNao;

[TODO] this file should be more generic, thus should not access to a specific robot platform

Line 321 // Make the last non-repeated frame hold shorter

[TODO] This is a temporal solution.

Line 355 // Fast repeat

[TODO] This is a temporal solution.

Line 363 mf.SpeedFraction = 0.35;

[TODO] Justify the value “0.35”

Line 428/472 mf.TimeStamp = curtimestamp++;

[TODO] specify MotionFrame.TimeStamp when create the behavior profile and use it to determine the order of the frames.

BehProfHeadRandomScan.cs

Line 47

[TODO] probabilistic model to select the movements that are less selected

BehProfLegRandomMove.cs

Line 19

[TODO] Make leg movement more left-right balanced.

Line 56

[TODO] improve code

Line 92

[TODO] probabilistic model to select the movements that are less selected

BehaviorProfileIntro.cs

[TODO] not implemented yet

BehaviorProfileLookAround.cs

[TODO] add “torso lean forward”

[TODO] add “rhythm” parameter for head movement

Line 86 if (headud >= 0)

[TODO] temp solution

BehaviorProfileMe.cs

[TODO] Repeated front pose (flap chest) need to be reworked to improve naturalness.

BehaviorProfileWeigh.cs

Line 120 this.UseSpeedFraction = true;

[TODO] need a more unified solution

BehaviorProfileWavyShape.cs

[TODO] not implemented yet.

NaoRobotManager.cs

Line 152 LoadBehaviors

[TODO] load from XML files.

Line 688/748 left/right/both hand gesture

[TODO] move to the BaseBehaviorProfile

Line 1001 Postpone leg movement

[TODO] differentiate "Postpone" from "Stop"

BehaviorProfileHandOver.cs / BehaviorProfileShowSide.cs

Line 55 double rshoulderroll\_init = 0;

[TODO] move the initial pose to base behavior class

BehaviorProfileImitGesDown.cs / BehaviorProfileImitGesUp.cs

Line 54 public void PreparationPose(double valence, out List<string> jointnames, out List<float> jointvals)

[TODO] move common initial/preparation pose to base behavior profile