======== Humanoid properties==================================
Center of Mass kept at 0.93 meters
Head: 33.0cm above Center of Mass
IMU: 16.0cm below Center of Mass
Lidar: 15.0cm above head
Kinect: 7.0cm above Head

======== RGBD==================================
Sensor: Kinect v2 http://smeenk.com/kinect-field-of-view-comparison/
Data 1: DEPTH.depth in millimeter readings
Data 2: RGB.image
*[Note] RGB.image data is chopped into a sequence of files because of its size issue.
% For example,
% RGB_3_1.mat has 1 to 300 frames
% RGB_3_2.mat has 301 to 600 frames
% ...
% RGB_3_4.mat has 901 to 996 frames
* RGBD files are provided only for the training set #0, 3, and the test set.
*[Note] DEPTH and RGB has other fields that contain metadata
*[Note] Intrinsic and extrinsic parameters are available in the subfolder 'cameraParam'

========Joint angles==================================
Joint angles
pos: Matrix of positions
ts: Array of timestamps
gyro: Matrix of gyro readings: figure(1);plot(ts(:), gyro(:,3))
Neck and Head positions are important for projecting the LIDAR readings.

```
idx = 1;
iNeck = get_joint_index('Neck') % head yaw
iHead = get_joint_index('Head') % head pitch
figure(2);plot(ts, pos(:, iHead))
%
t = ts(idx);
head_angles = [pos(idx,iNeck), pos(idx,iHead)];
```

NOTE : Since Neck and Head positions are very important information, we additionally provide head_angles, which is made by above procedure. In addition, there are many kinds of joint information of THOR, if you want them, you can use them for this project.

joint.mat
acc, ft_l, ft_r, gyro, pos, rpy, ts Head_angles = [pos(1,:); pos(2,:)];

head_angles = [pos(iNeck,:); pos(iHead,:)]; %iNeck = 1, iHead = 2
head_angles = [pos(1,:); pos(2,:)];
head_angles = [Neck angle; Head angle]

========Odometry==================================
Odometry
lidar{i}.pose: [x, y, theta]

+x: forward from robot
+y: left from robot
+z: up from robot
theta: rotation around +z

ts for joints is ABSOLUTE time

NOTE : lidar.t is Absolute time.

>> lidar{1}.t - t0

ans =

   17.2477

========Lidar==================================

http://www.hokuyo-aut.jp/02sensor/07scanner/download/pdf/UTM-30LX_spec_en.pdf

Data structure of lidar.mat

 <exemple>
 t: 1.4268e+09(absolute time)
 rsz: 4324 (meaningless for this project)
 pose: [0 0 0] (absolute odometry)
 res: 0.0044 (radian, resolution)
 rpy: [-0.0120 -0.0164 -0.1107] (IMU roll pitch yaw)
 scan: [1x1081 single] (Radar scan data, range -135deg to 135 deg)
 (You should check the spec of Hukuyo lidar)