Table of Contents


```
function catch_ball(sample_th, catch_height)
```

ROS setup

```
    %Publisher
    RefPub = rospublisher('reference','geometry_msgs/Vector3');
    RefMsg = rosmessage('geometry_msgs/Vector3');


    %Subscriber
    ball_pos = rossubscriber('/object_update');
    sub = rossubscriber('/encoder','geometry_msgs/Vector3');
```

```
Error using catch_ball (line 4)
The global ROS node is not initialized. Use "rosinit" to start the
 global node and connect to a ROS network.
```

Setup IK

```
    [gik, posTgt, jointConst, robot, ~ ,  ~]=setupIK();
```

Setup parameters

```
        n_samples = 40;
        N_estim = 1;
```

Sample

```
    [samples, time_sampling] = sample(n_samples, sample_th);
    sum(time_sampling)
```

Estimate

```
    tic
    %estimations = estimation(samples, N_estim, catch_height,
 time_sampling);
```

```
    estimations = estimation2(samples,catch_height, time_sampling);
    pos = [estimations(1,1) estimations(1,2) estimations(1,3)]; % end
= 1
    toc
```

Ik

```
    tic
    posTgt.TargetPosition = pos;
    [q,~] = gik(homeConfiguration(robot),posTgt, jointConst); %Inverse
Kinematics
    RefMsg.X = -q(1).JointPosition; RefMsg.Y =  -q(2).JointPosition;
RefMsg.Z = -q(3).JointPosition;
    toc
```

Publish motion

```
    tic
    send(RefPub,RefMsg);
    toc

end
```

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