

```
%%% SetupBipedRobot.m
```

```
%%% Set biped robot structure of Figure 2.19, 2.20
```

```
%%% Field definition: Table 2.1 Link Parameters
```

```
global uLINK
```

```
ToDeg = 180/pi;
```

```
ToRad = pi/180;
```

```
UX = [1 0 0]';
```

```
UY = [0 1 0]';
```

```
UZ = [0 0 1]';
```

```
uLINK = struct('name','BODY' , 'm', 10, 'sister', 0, 'child', 2, 'b',[0 0 0] , 'a',UZ,'q',0);
```

```
uLINK(2) = struct('name','RLEG_J0' , 'm', 5, 'sister', 8, 'child', 3, 'b',[0 -0.1 0]' , 'a',UZ,'q',0);
```

```
uLINK(3) = struct('name','RLEG_J1' , 'm', 1, 'sister', 0, 'child', 4, 'b',[0 0 0]' , 'a',UX,'q',0);
```

```
uLINK(4) = struct('name','RLEG_J2' , 'm', 5, 'sister', 0, 'child', 5, 'b',[0 0 0]' , 'a',UY,'q',0);
```

```
uLINK(5) = struct('name','RLEG_J3' , 'm', 1, 'sister', 0, 'child', 6, 'b',[0 0 -0.3]' , 'a',UY,'q',0);
```

```
uLINK(6) = struct('name','RLEG_J4' , 'm', 6, 'sister', 0, 'child', 7, 'b',[0 0 -0.3]' , 'a',UY,'q',0);
```

```
uLINK(7) = struct('name','RLEG_J5' , 'm', 2, 'sister', 0, 'child', 0, 'b',[0 0 0]' , 'a',UX,'q',0);
```

```
uLINK(8) = struct('name','LLEG_J0' , 'm', 5, 'sister', 0, 'child', 9, 'b',[0 0.1 0]' , 'a',UZ,'q',0);
```

```
uLINK(9) = struct('name','LLEG_J1' , 'm', 1, 'sister', 0, 'child',10, 'b',[0 0 0]' , 'a',UX,'q',0);
```

```
uLINK(10)= struct('name','LLEG_J2' , 'm', 5, 'sister', 0, 'child',11, 'b',[0 0 0]' , 'a',UY,'q',0);
```

```
uLINK(11)= struct('name','LLEG_J3' , 'm', 1, 'sister', 0, 'child',12, 'b',[0 0 -0.3]' , 'a',UY,'q',0);
```

```
uLINK(12)= struct('name','LLEG_J4' , 'm', 6, 'sister', 0, 'child',13, 'b',[0 0 -0.3]' , 'a',UY,'q',0);
```

```
uLINK(13)= struct('name','LLEG_J5' , 'm', 2, 'sister', 0, 'child', 0, 'b',[0 0 0]' , 'a',UX,'q',0);
```

```
[uLINK(1).vertex,uLINK(1).face] = MakeBox([0.1 0.3 0.5] ,[0.05 0.15 -0.05] ); %
```

```
BODY
```

```
[uLINK(7).vertex,uLINK(7).face] = MakeBox([0.2 0.1 0.02] ,[0.05 0.05 0.05]); %
```

```
Foot
```

```
[uLINK(13).vertex,uLINK(13).face] = MakeBox([0.2 0.1 0.02] ,[0.05 0.05 0.05]); %
```

```
Foot
```

```
FindMother(1); % Find mother link from sister and child data
```

```
%%% Substitute the ID to the link name variables. For example, BODY=1.
```

```
for n=1:length(uLINK)
    eval([uLINK(n).name, '=', num2str(n), ';']);
end

uLINK(BODY).p = [0.0, 0.0, 0.65]';
uLINK(BODY).R = eye(3);
ForwardKinematics(1);

uLINK(BODY).v = [0 0 0]';
uLINK(BODY).w = [0 0 0]';
for n=1:length(uLINK)
    uLINK(n).dq = 0;           % joint speed [rad/s]
end
```