Tutorial 21: Programmatically Convert Joints into Drives (SimMechanics)

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Complete List of all Tutorials with Publishable MATLAB Files of this Solid-Geoemtries Toolbox

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Motivation for this tutorial: (Originally SolidGeometry 3.0 required)

2. Creating a new SimMechanics System

```
smbNewSystem ('SG_LIB_EXP_21');          % Creates the mechansim diagramm
```
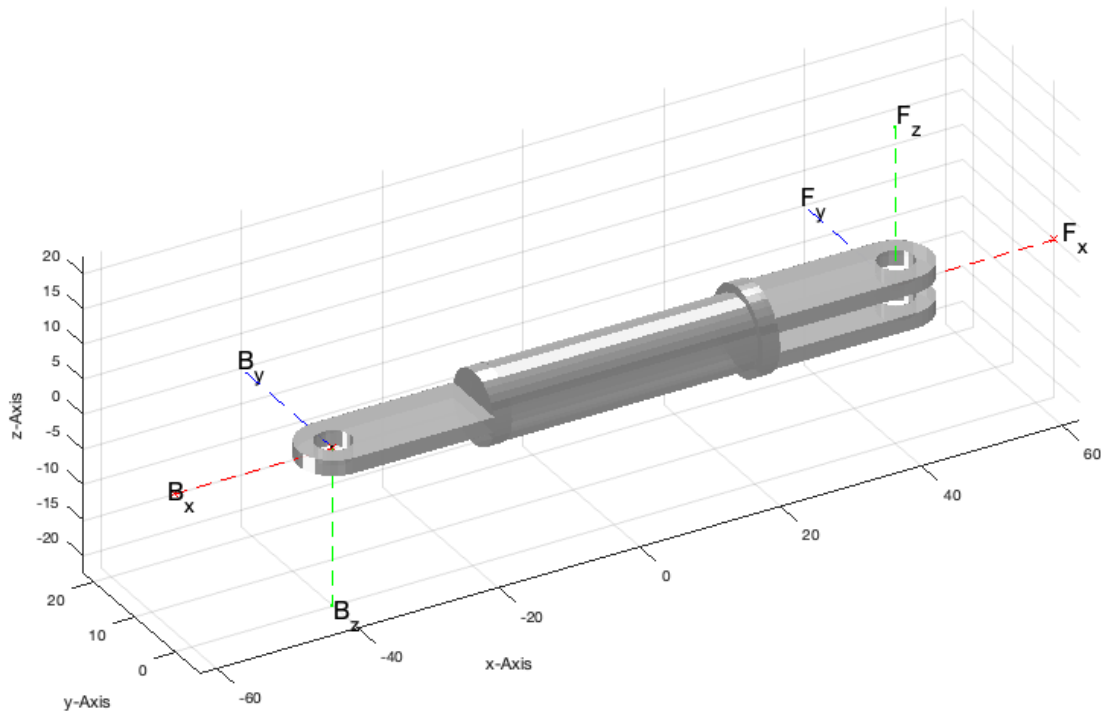
```
Creating temporary directory '/Users/timlueth/Desktop/tmp_SG_LIB_EXP_21/'
```


3. Create two links with length 50 and 80 and one or two mounting holes

```
SG1=SGmodelLink(80,'',1,2);              % Creates a long rod with flange
SG2=SGmodelLink(60,'',1,2);              % Creates a short rod with flange
```
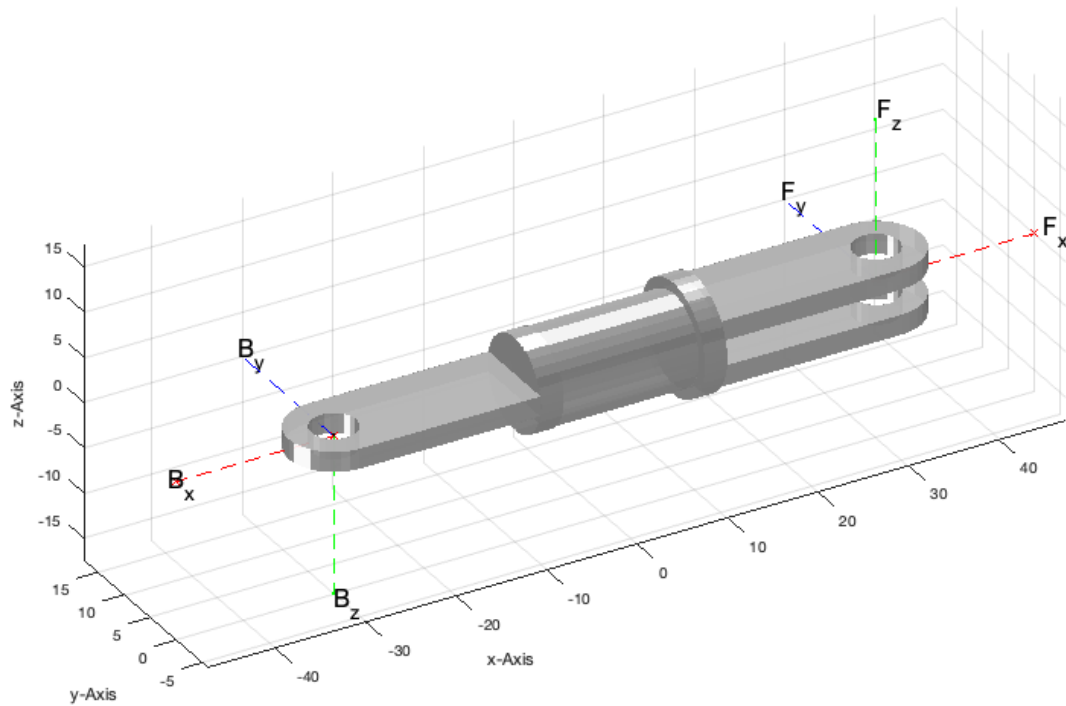
```
SGfigure; view(-30,30); axis on;
SGT(SG1);
```
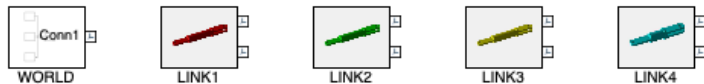


```
SGfigure; view(-30,30); axis on;
SGT (SG2);
```

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4. Create SimMechanics models for the four links in different colors

```
smbCreateSG (SG1,'LINK1','r');          % Add long rod as LINK1
smbCreateSG (SG1,'LINK2','g');          % Add short rod as LINK2
smbCreateSG (SG1,'LINK3','y');          % Add long rod as LINK3
smbCreateSG (SG2,'LINK4','c');          % Add short rod as LINK4
smbDrawNow;
```
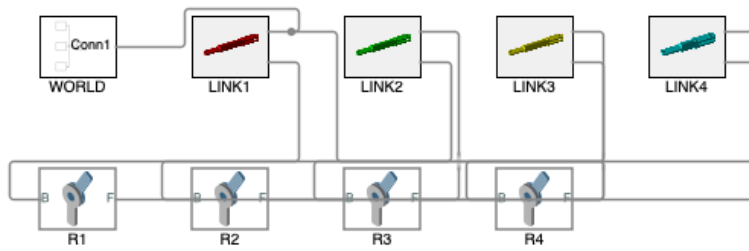

5. Create SimMechanics models for the four joint and connect them with the links

```
smbCreateJoint ('R','R1','LINK1.F','LINK2.B'); % Add a RR Joint
smbCreateJoint ('R','R2','LINK2.F','LINK3.B'); % Add a RR Joint
smbCreateJoint ('R','R3','LINK3.F','LINK4.B'); % Add a RR Joint
smbCreateJoint ('R','R4','LINK4.F','LINK1.B'); % Add a RR Joint
smbDrawNow;
```
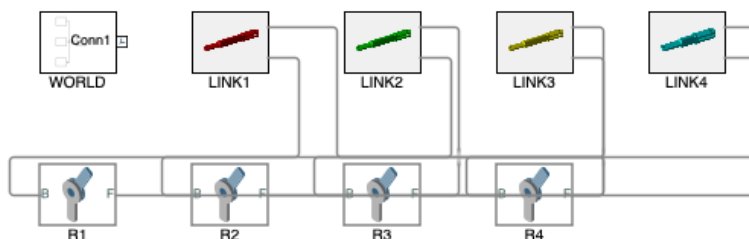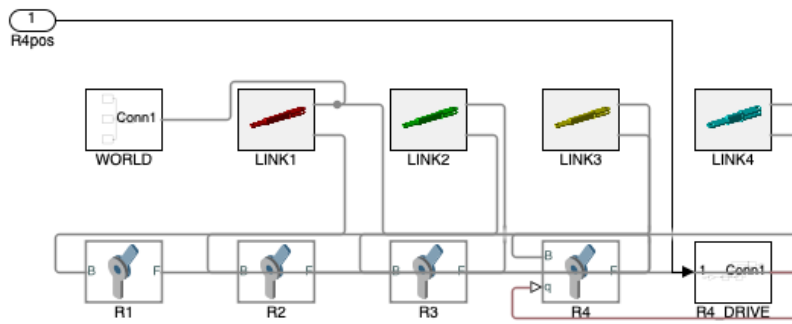

6. Connect the base frame of link1 to the world coordinate system

```
smbCreateConnection('WORLD.ORIGIN','LINK1.B'); % Connect Linkage to World Frame
smbDrawNow;
```


7. Create a SimMechanics model for a motor/drive and use a Cosinus Rotation

```
smbCreateDrive ('R4');                    % Convert Joint R4 into a Drive
smbDrawNow;
```
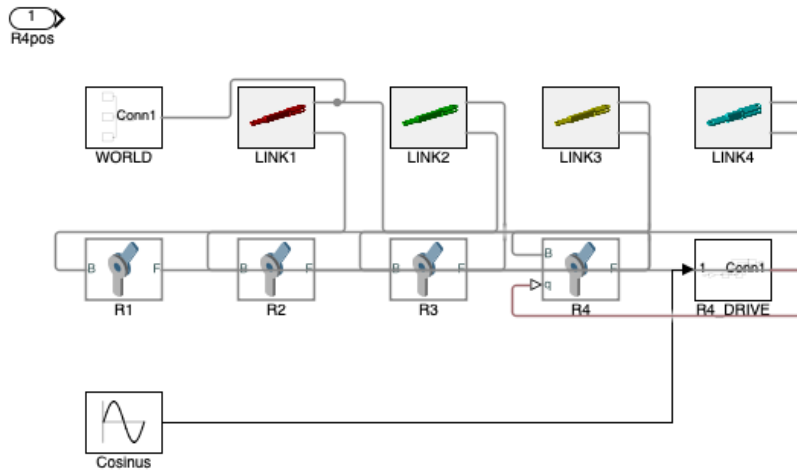

8. Create a Simulink models for a cosinus signal

```
smbCreateSineWave ('Cosinus','R4_DRIVE/1');    % Connect a Sinus Generator to Drive
smbDrawNow;

smbSimulate(5);

%  bdclose('all');pause(1);
```

9. Create a Video of the Simualatin for 10 seconds

smbVideoSimulation; % Show a 5 seconds video

Final remarks on toolbox version and execution date

```
VLFLlicense
```

```
This VLFL-Lib, Rel.  (2023-Oct-03), is for limited non commercial educational use only!
Licensee: Tim Lueth (Development Version)!
Please contact Tim Lueth, Professor at TU Munich, Germany!
WARNING: This VLFL-Lib (Rel. ) license will exceed at 06-Jul-2078 07:45:06!
Executed 03-Oct-2023 07:45:08 by 'timlueth' on a MACI64 using Mac OSX 13.6 | R2023a Update 5 | SG-Lib 5.4
======================================= Used Matlab products: =======================================
distrib_computing_toolbox
map_toolbox
matlab
simmechanics
simscape
simulink
=====================================================================================================
```

- *Tim Lueth, tested and compiled on OSX 10.11.6 with Matlab 2016 on 2016-12-09*

- *_____, executed and published on 64 Bit PC using Windows with Matlab 2015a on 2015-xx-xx_*

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