```
>> trans_A_to_B = [ cos(pi/4) -sin(pi/4) 0 6; sin(pi/4) cos(pi/4) 0 3; 0 0 1 -4; 0 0 0 1]

trans_A_to_B =

    0.7071   -0.7071         0    6.0000
    0.7071    0.7071         0    3.0000
         0         0    1.0000   -4.0000
         0         0         0    1.0000

>> rot_A_to_B = trans_A_to_B(1:3, 1:3)

rot_A_to_B =

    0.7071   -0.7071         0
    0.7071    0.7071         0
         0         0    1.0000

>> B_0_wrt_A = trans_A_to_B(4, 1:3)

B_0_wrt_A =

     0     0     0

>> B_0_wrt_A = trans_A_to_B(1:3, 4)

B_0_wrt_A =

     6
     3
    -4

>> rot_B_to_A = transpose(rot_A_to_B)

rot_B_to_A =

    0.7071    0.7071         0
   -0.7071    0.7071         0
         0         0    1.0000

>> A_0_wrt_B = -1 * rot_B_to_A * B_0_wrt_A

A_0_wrt_B =

   -6.3640
    2.1213
    4.0000

>> trans_B_to_A = [rot_B_to_A A_0_wrt_B; 0 0 0 1]

trans_B_to_A =
```

```
    0.7071    0.7071         0   -6.3640
   -0.7071    0.7071         0    2.1213
         0         0    1.0000    4.0000
         0         0         0    1.0000

>> F_wrt_B = [1; 7; 3]

F_wrt_B =

     1
     7
     3

>> F_wrt_A = trans_B_to_A * F_wrt_B
Error using  *
Incorrect dimensions for matrix multiplication. Check that
the number of columns in the first matrix matches the number
of rows in the second matrix. To perform elementwise
multiplication, use '.*'.

Related documentation

>> F_wrt_B = [1; 7; 3; 1]

F_wrt_B =

     1
     7
     3
     1

>> F_wrt_A = trans_B_to_A * F_wrt_B

F_wrt_A =

   -0.7071
    6.3640
    7.0000
    1.0000

>>
```