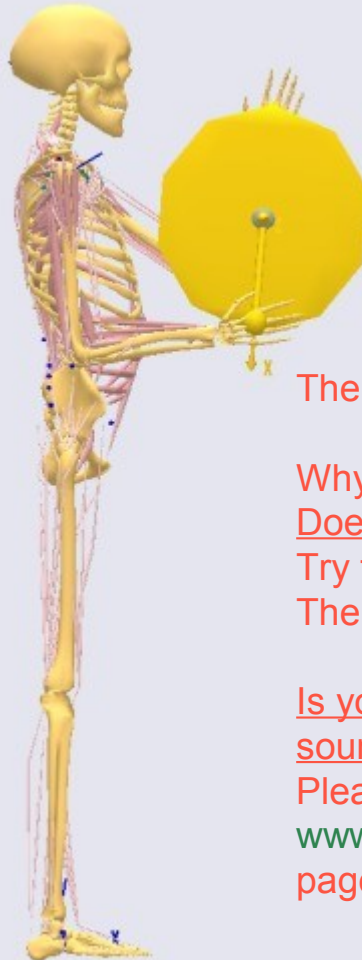# Online Modeling Demo

Søren Tørholm

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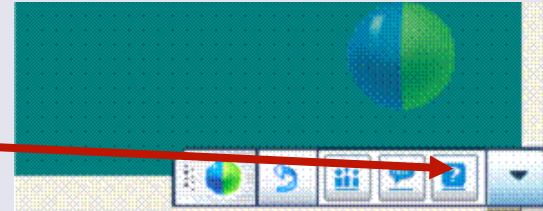www.anybodytech.com -> Webcasts (bottom of the page)

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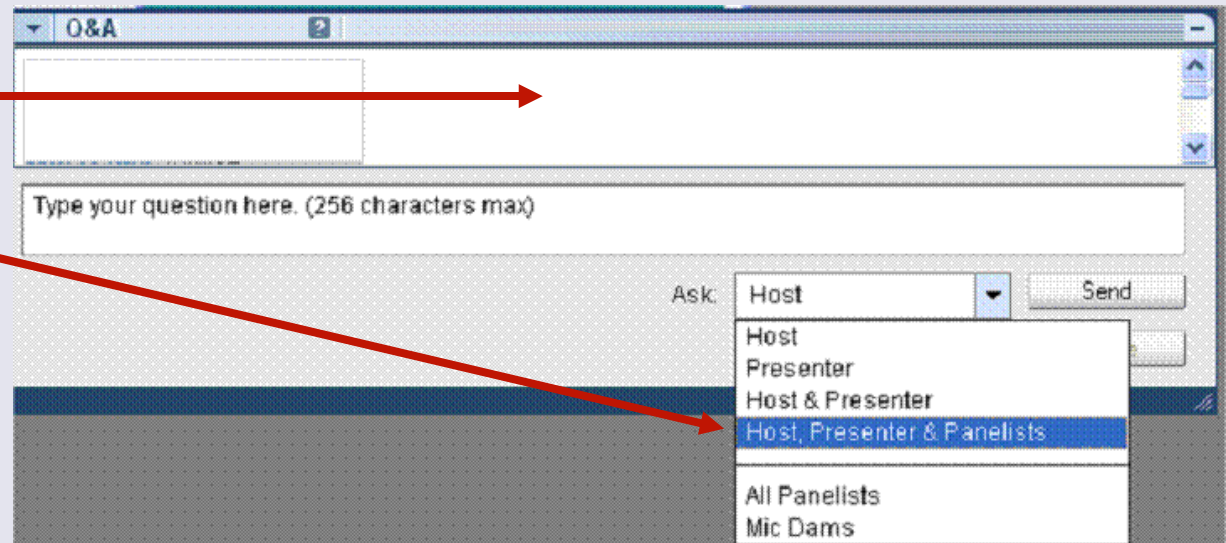

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Intro

The ARep branch of the repository contains a large amount of applications where different collections of body parts are hooked up to more or less complicated environments.

Some of these environments may be extremely simple, such as a floor to stand on, while others may be mechanisms in their own right such as wheel chairs or bicycles with complicated crank mechanisms. In the vast majority of cases, the easiest way to develop a new application is to find a similar existing application, copy it, and modify it to suit your purpose.

This webcast is based on the Building Block tutorial lesson 1-4

Intro

- First step is to open an existing model

- Then we will add a new segment to this model

- We will then change the kinematics of the model, so that the arms are controlled by the new segment

- Finally we will add load to the model and explore the results.

Online Modeling Demo

Søren Tørholm

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Keeping track on the number of DOF.

A typical problem for a new user is make the kinematics work out.

If you start out with a model that is working and do modifications on its drivers, you need keep track on the number of dof you add and remove to the model

It is very important that the number of drivers match the no of dof in the model.

It is equally important that the drivers applied do not create kinematical conflicts which each other, or in other words drives the same DOF in the model.

Small eye opener
Planar slider-crank mechanism

‘crank’ ‘coupler’

‘slider’

$\theta = \omega t$
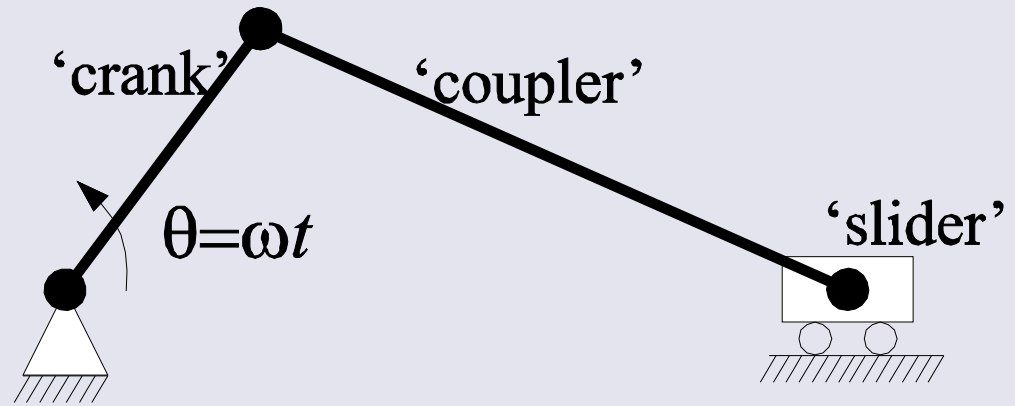
Counting DOF, 2D (3D):

Number of DOFs of free segments (*n*=3)	**9**	(18)
3 revolute and 1 slider, each having 2 constraints in 2D.	**8**	(20)
Number of DOFs of system	**1**	(-2 !)
1 driver at the crank	**1**	(1)
Determinacy of the system	**0**	(-3)

Redundant constraints in 3-D!

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If the kinematics fails

- Improve the initial positions
- Make sure you know the number of DOF in the model
- Try to return to a working model by undoing changes if possible
- If you have kinematically closed loops, disconnect these and insert joint drivers instead
- Do a small stick figure of the your model and make sure that the applied drivers will be able to work
- Explore the information obtained using the ModelInformation operation

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Further information

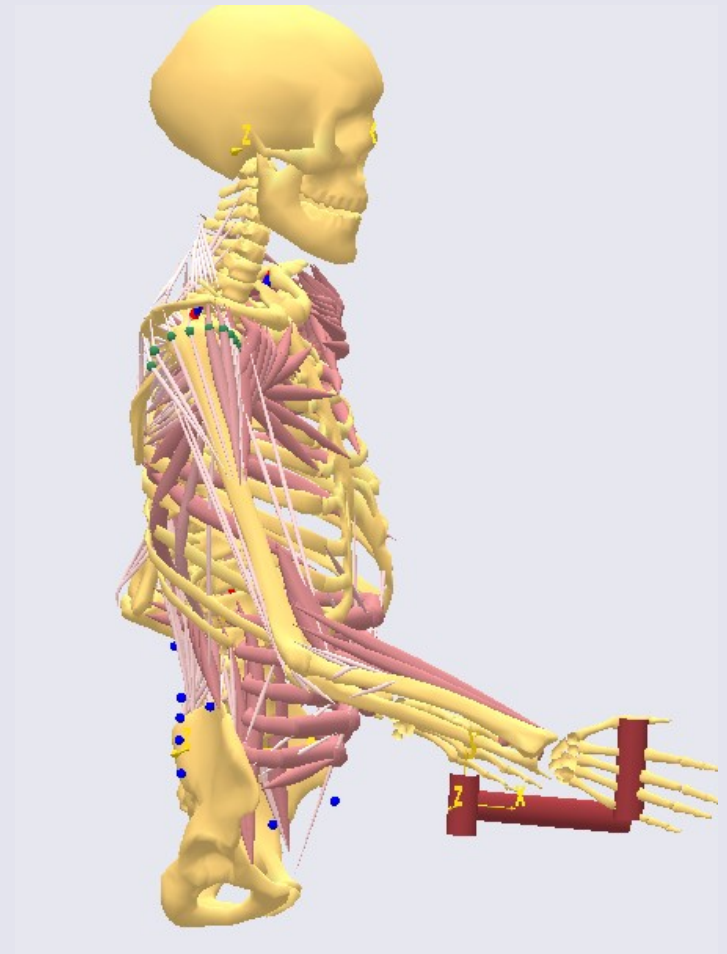- Modeling discussions and support:
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- Papers, references and models:
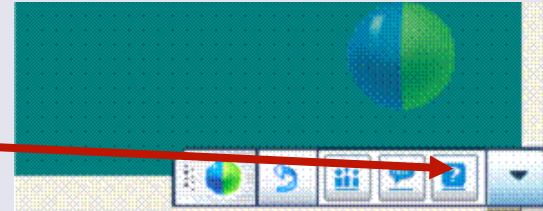 www.anybody.aau.dk

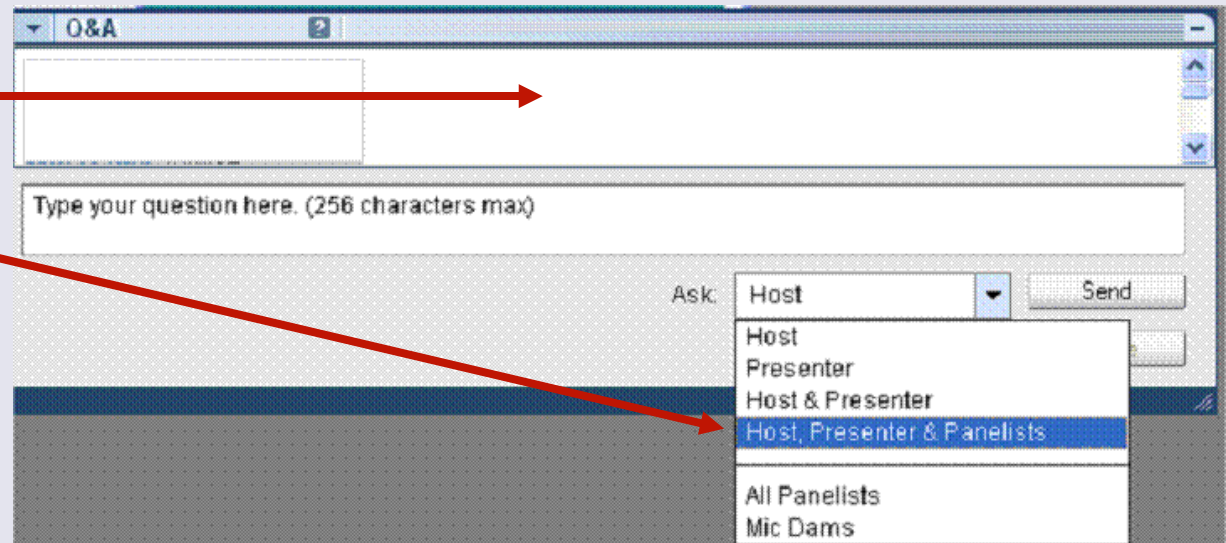- Software downloads, documentation, newsletter:
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