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Interact with Speciknee: A Software Tool for Design of Simple Four-bar Prosthesic Knee Joints

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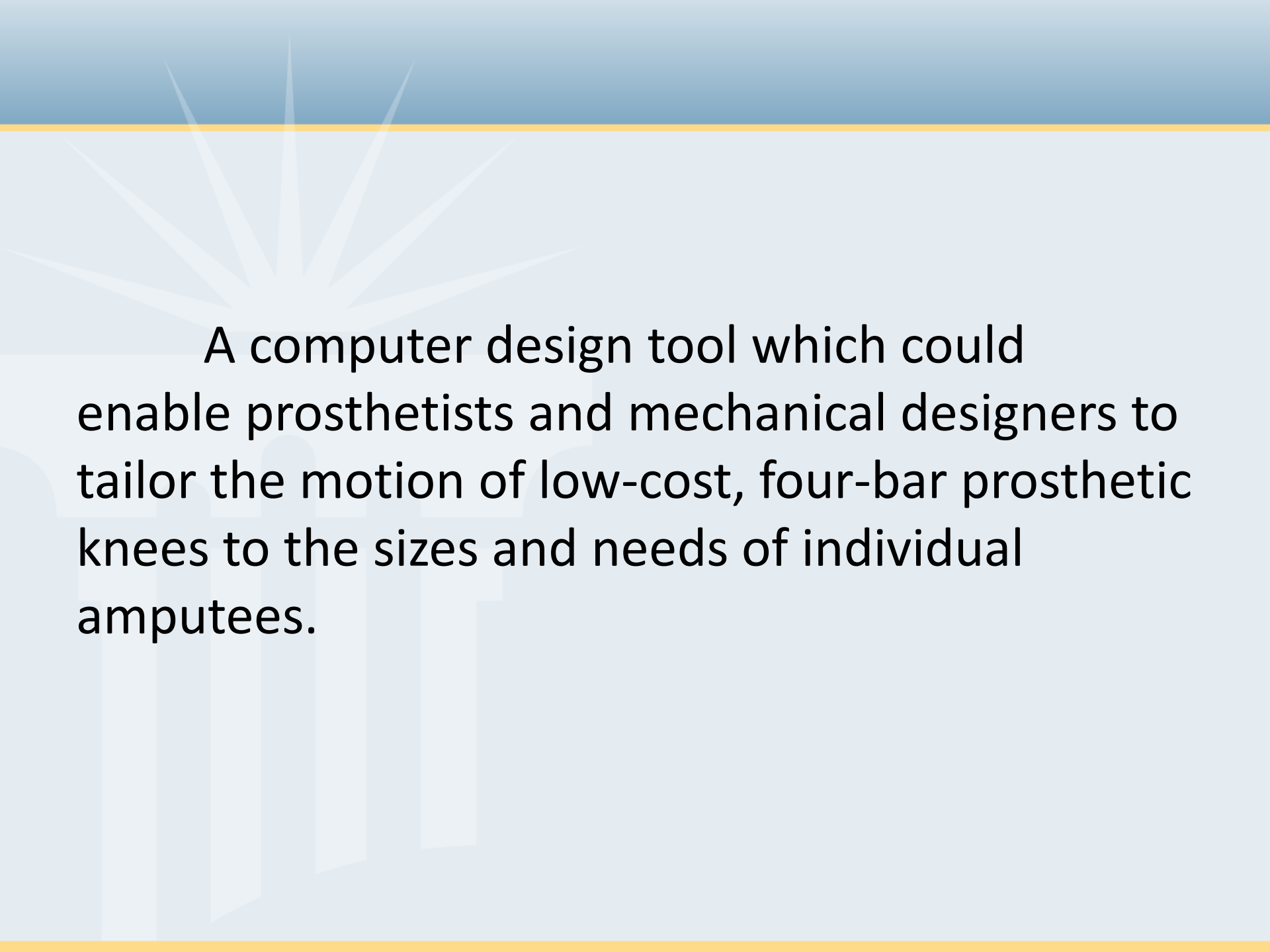
Interact with Speciknee: a software tool for design of simple four-bar prosthetic knee joints

Thomas Thompson and Erkai Watson

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April 16, 2014

A computer design tool which could enable prosthetists and mechanical designers to tailor the motion of low-cost, four-bar prosthetic knees to the sizes and needs of individual amputees.

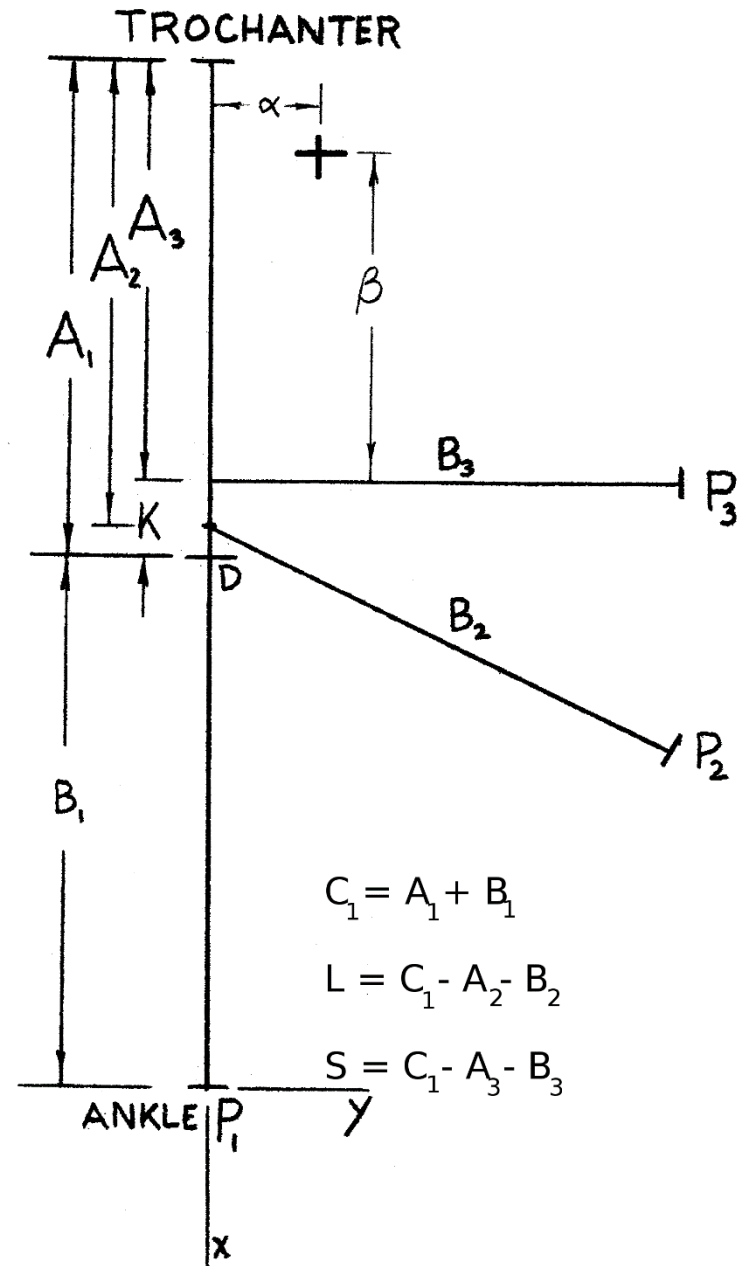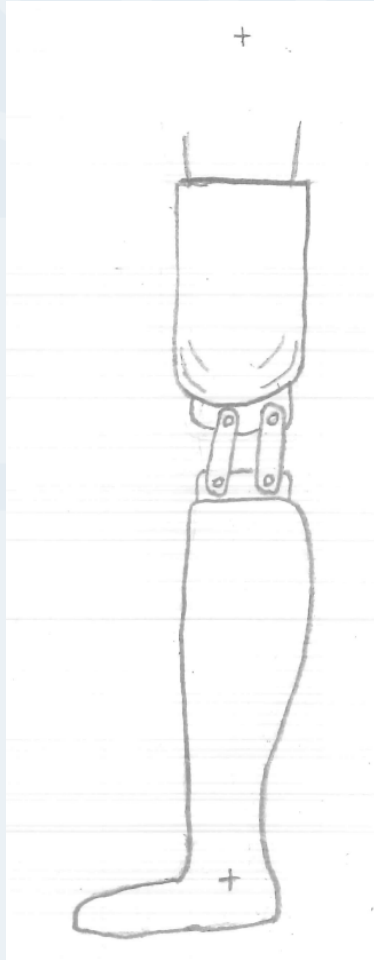# Intent: Possibly work with LIMBS International

Learning for LIMBS *expand to learn more*

Design, Create, Test and Train
Highly Functional Low Cost Artificial Limbs

Knee Prosthesis Nomenclature

TROCHANTER

$C_1 = A_1 + B_1$

$L = C_1 - A_2 - B_2$

$S = C_1 - A_3 - B_3$

ANKLE

Try It Yourself!

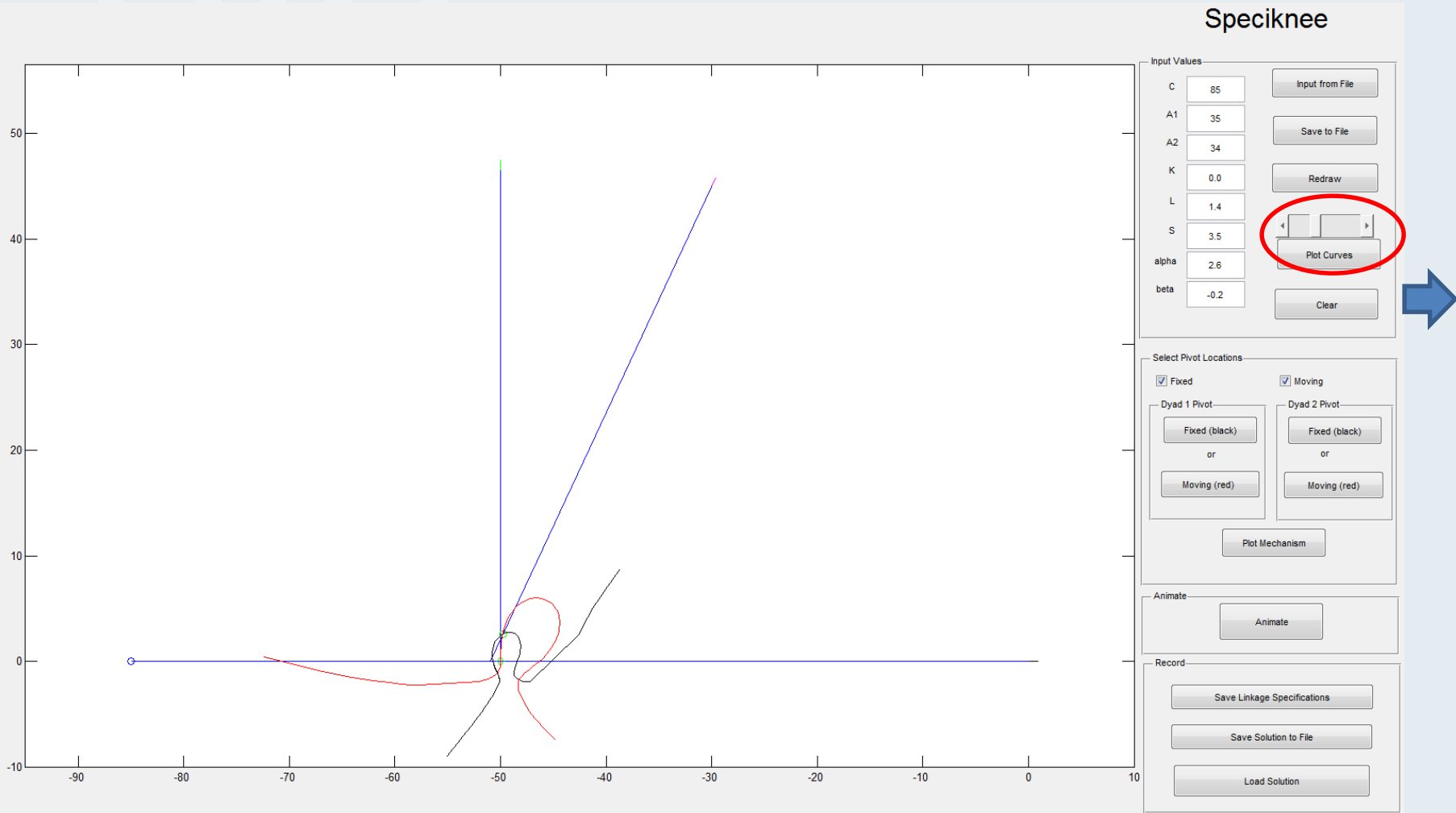# Upload Classic Parameter Sets (input from file), Define Your Own, or Use Defaults
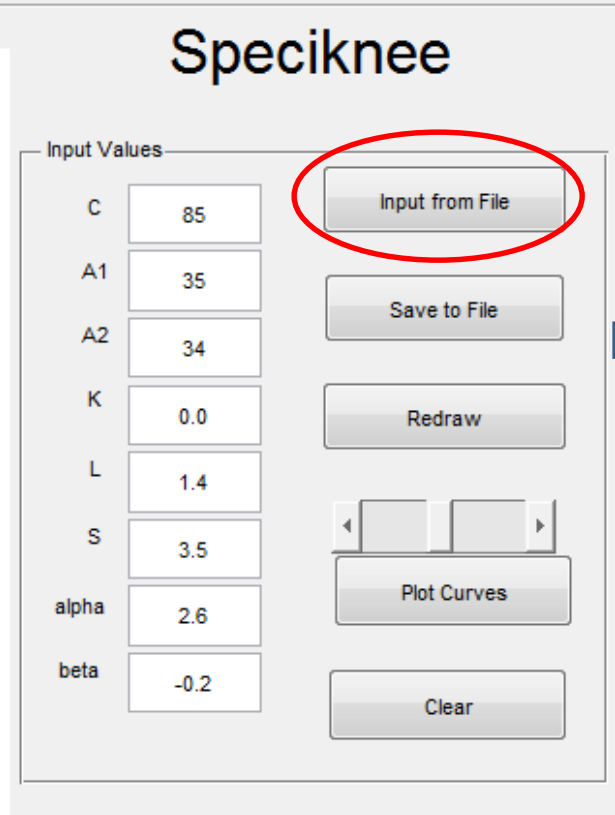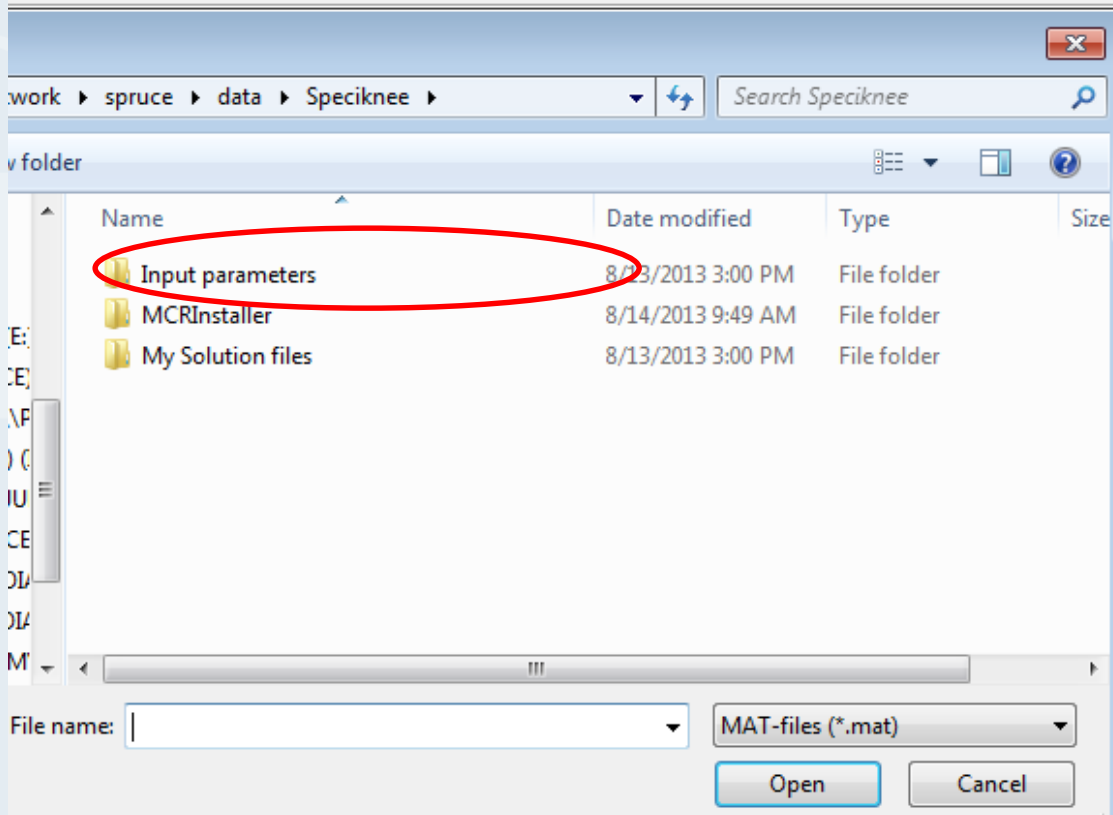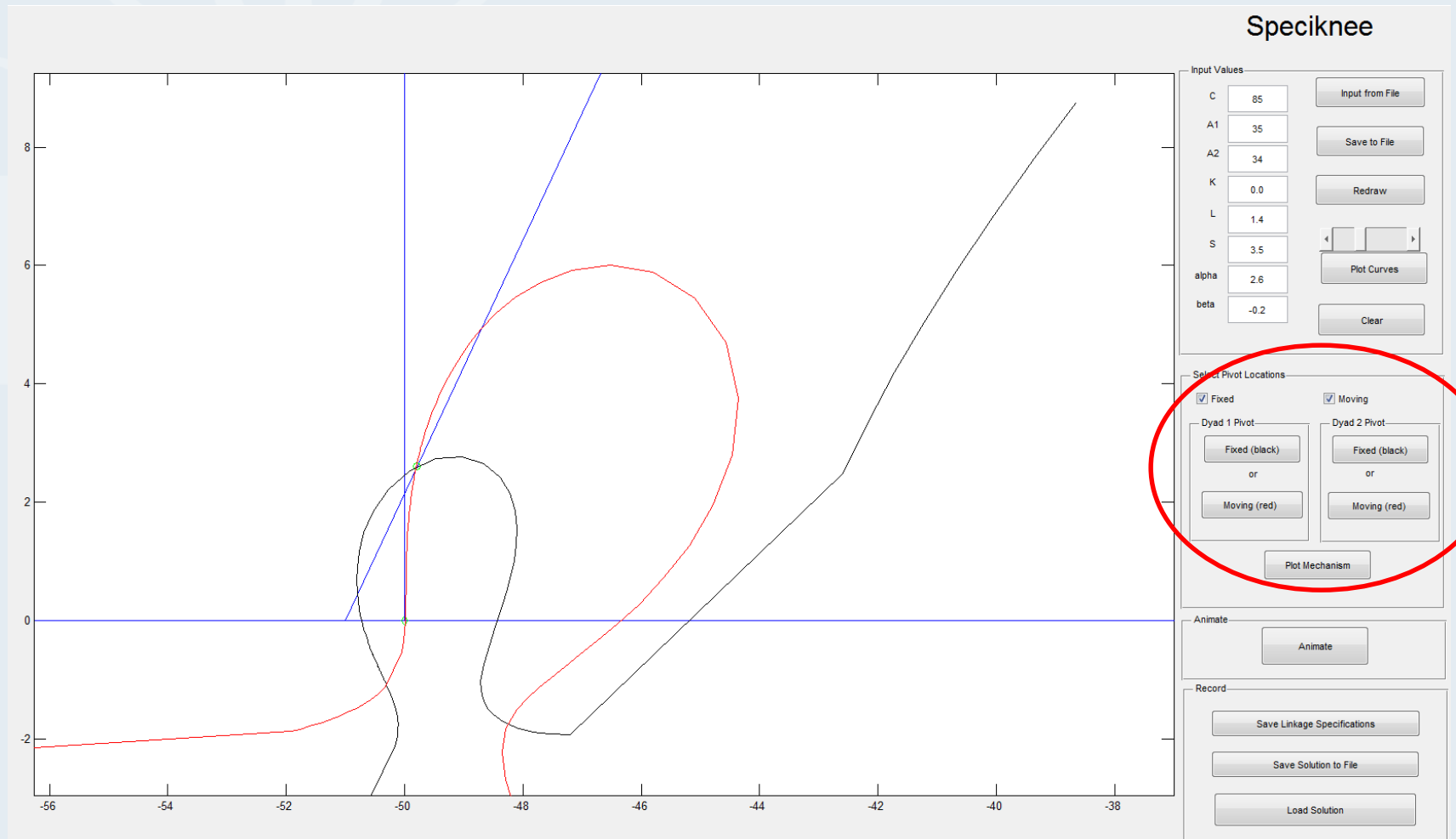
Redraw to Show Positions

Plot Curves, Using the Slider to Adjust Point Density if Necessary

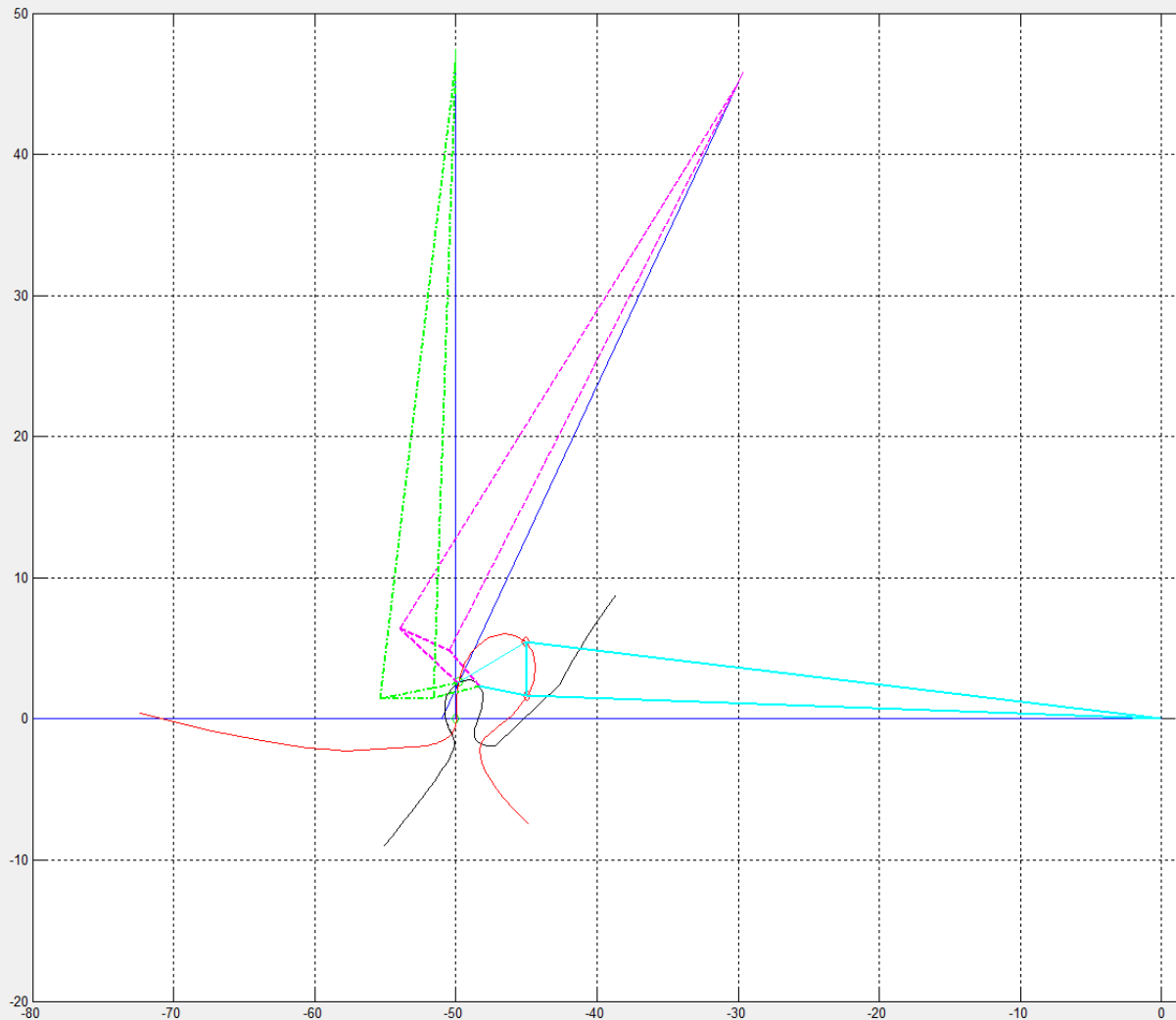# After Zooming, Pick Fixed or Moving Pivots Along Curves

For Dyad 1, Moving Pivot Location was Selected (along red curve)

For Dyad Two, the Fixed Pivot was Chosen (along the black curve)

Then Plot the Mechanism's Three Defining Positions

Animate (Magenta Stars Indicate Problem Positions)
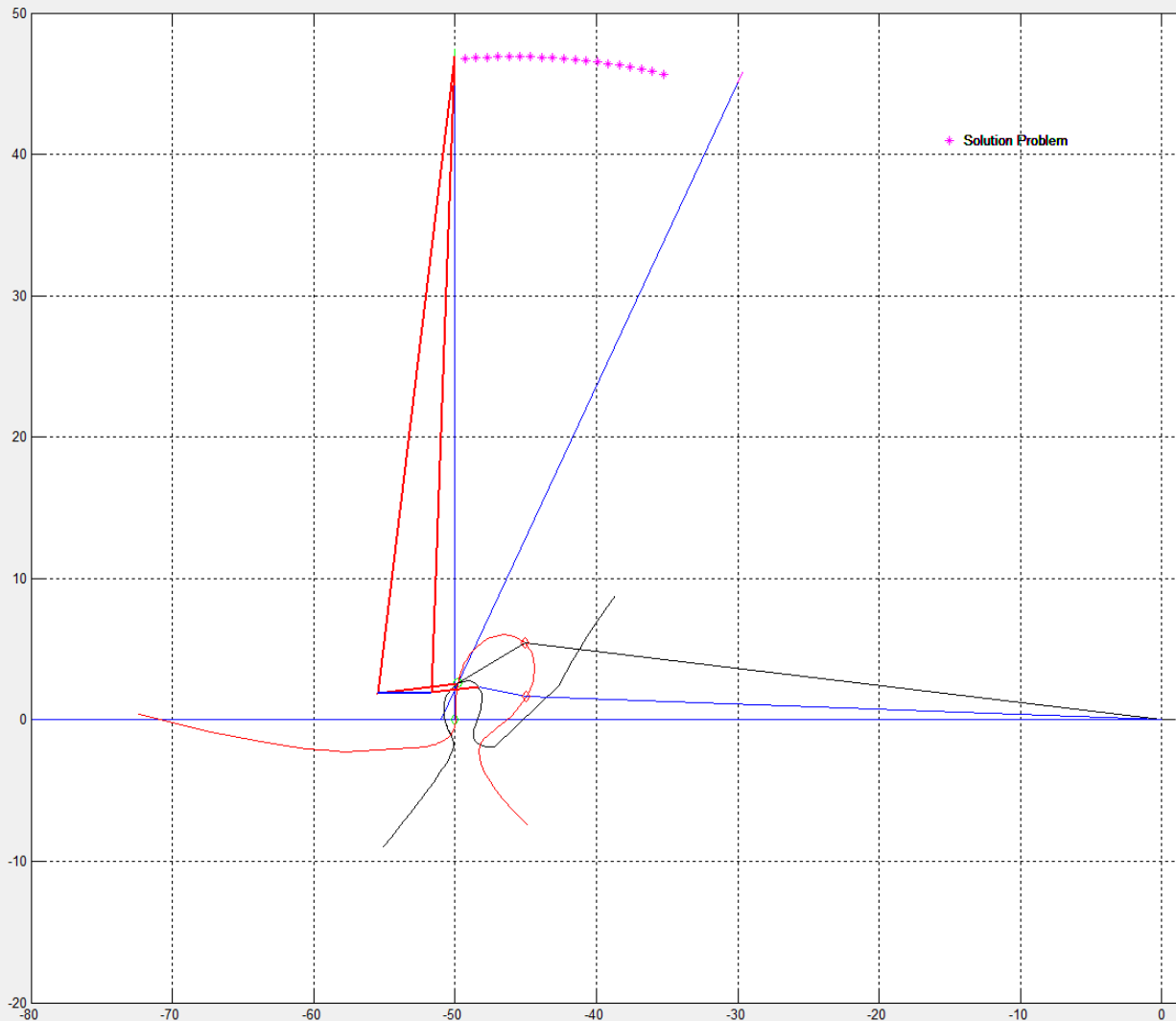
After Iterating on Pivot Positions
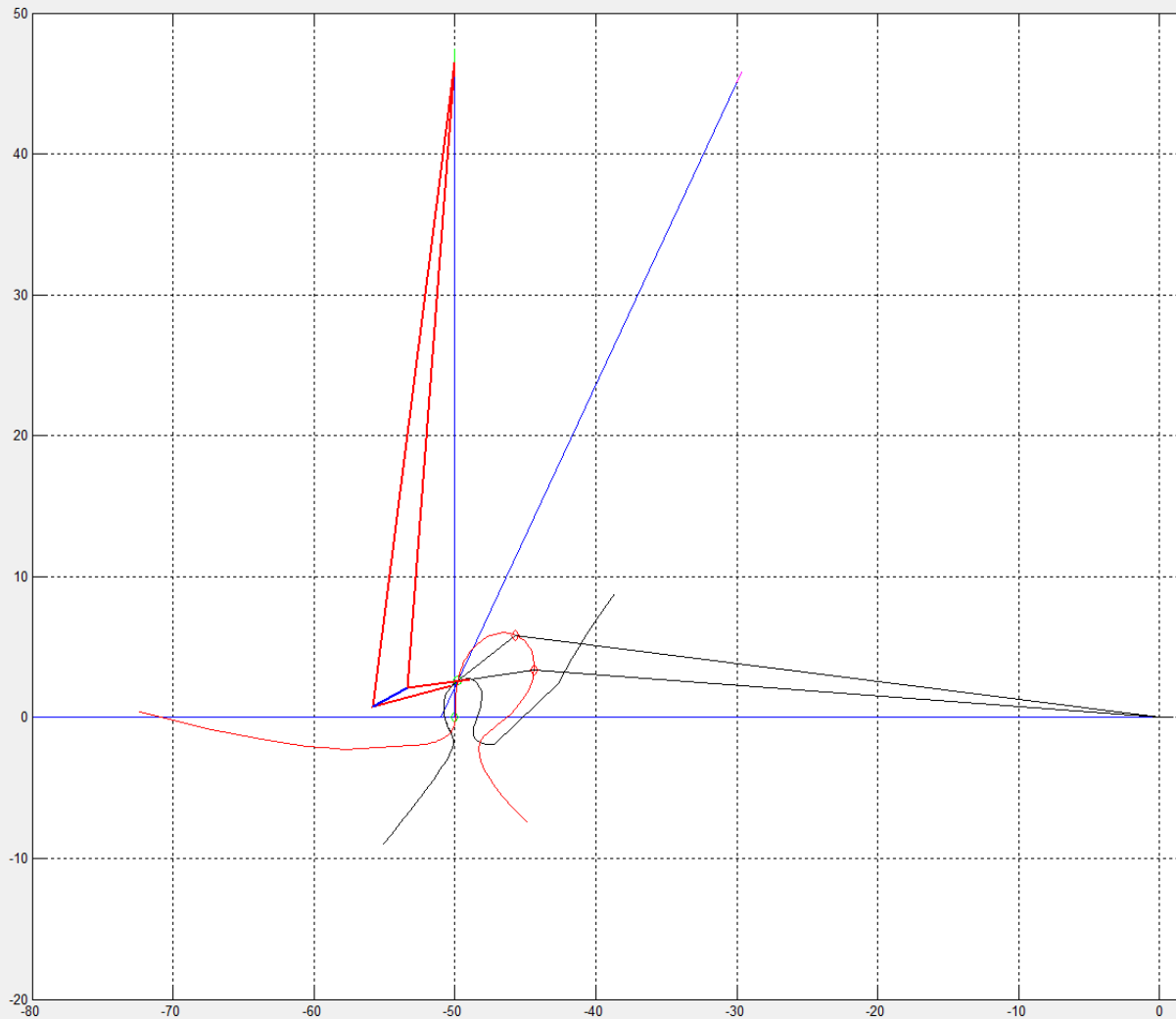
Can Save to a File Describing Linkage or a File Containing Complete Solution Information
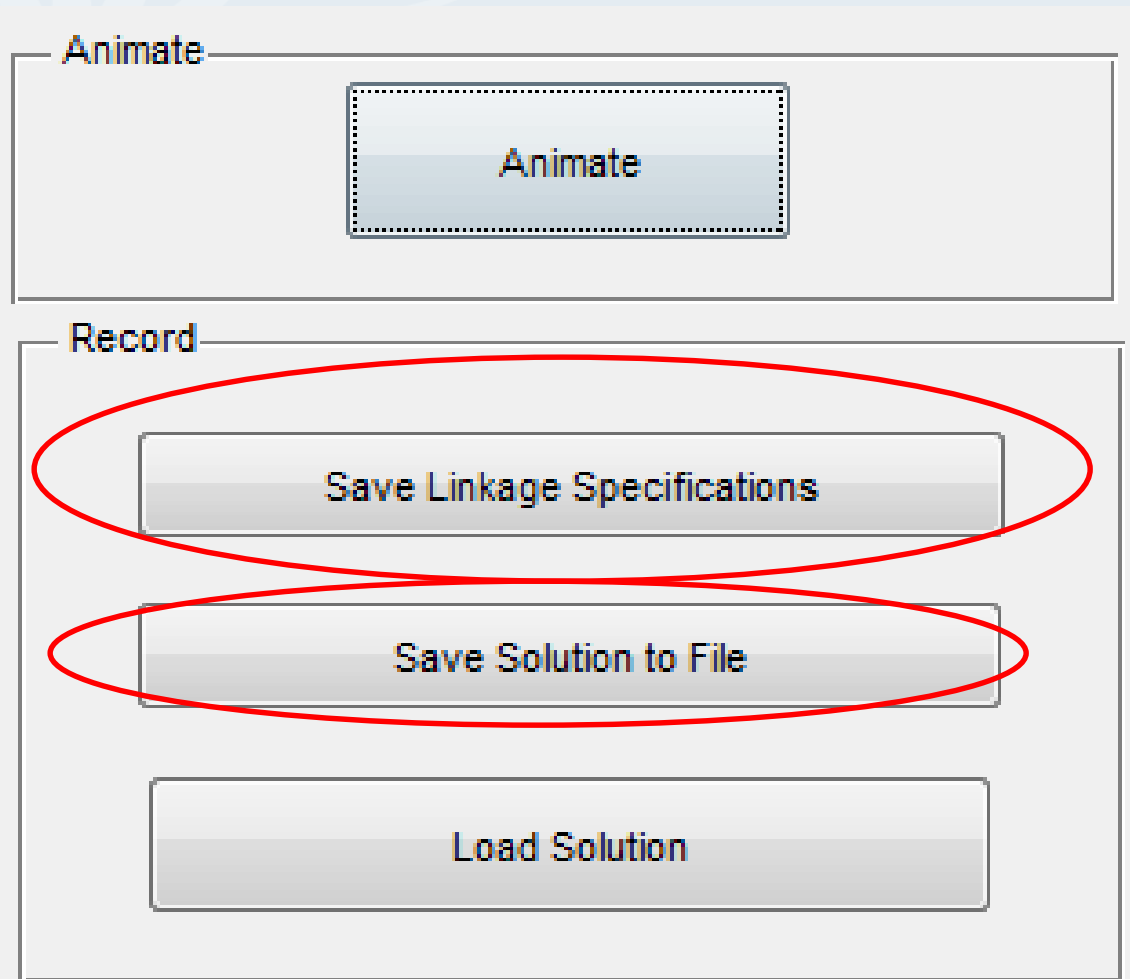
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- Professor Tim Tuinstra, matlab go-to

- Erkai Watson, programming assistant