Singularity Traces of Planar Linkages That Include Prismatic and Revolute Joints
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Introduction
Understanding the motion characteristics of a mechanism is an important step toward designing machinery to accomplish a given set of tasks. The purpose of this research is to understand the motion characteristics of a linkage as a design parameter is altered.

Method
I. Build a mathematical model for the linkage.
II. Find solutions for the set of equations in the mathematical model.
III. Validate the results by drawing the mechanism in SolidWorks.

Future Goals
Generating singularity traces for spatial mechanisms

Inverted Slider-Crank Mechanism

Inverted slider crank mechanism position vector loop

Slider-Crank Mechanism

Position vector loop for a slider-crank

Assur IV/3 Mechanism

Assur IV/3 linkage position vector loop

Inverted Slider-Crank at a critical point

Inverted Slider-Crank at a singularity

Slider-crank singularity trace

Motion curve at \( a_1 = 2.5 \)

Motion curve at \( a_1 = 8.5 \)

Motion curve at \( a_1 = 6 \)

Spatial Mechanism

RCCC linkage

Spherical four bar mechanism