Hettich Hinge Watt I 6-bar Mechanism
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NASA 8-dof ARMII Robot
Zero-dof (or less) Structures

- Statically Determinate Structure
- Statically Indeterminate Structure

One-dof Mechanisms

- 4-Bar Mechanism
- Offset Slider-Crank Mechanism
- Spur Gear Mechanism
- Cam-and-Follower Mechanism
4-Bar Rolling Mechanism

Dual-Slider Mechanism

Pantograph Robot

Ratchet Mechanism

Toggle Mechanism
Watt Straight-Line Mechanism (approximate)

Roberts Straight-Line Mechanism (approximate)

Chebyshev Straight-Line Mechanism (approximate)

Peaucellier Straight-Line Mechanism (exact)

Scott-Russell Straight-Line Mechanism (exact)
Crank-Shaper Quick-Return Mechanism

Whitworth Quick-Return Mechanism  Drag-Link Quick-Return Mechanism
5-bar Slotted Mechanism

5-bar Slotted Slider Mechanism

6-bar Mechanism

6-bar Single-Slider Mechanism

6-bar Crank Dual-Slider Mechanism

6-bar Crank Triple-Slider Mechanism
Stephenson I 6-Bar Mechanism

Stephenson II 6-Bar Mechanism

Stephenson III 6-Bar Mechanism

Watt I 6-Bar Mechanism

Watt II 6-Bar Mechanism
4-Bar Clamp Mechanism

4-Bar Film Advance Mechanism

4-Bar Aircraft Carry-on Bin Mechanism

4-Bar Bass Drum Pedal Mechanism

4-Bar Conveyor Transfer Mechanism

Dual 4-bar Balance Scale Mechanism

4-Bar Knee Prosthesis Mechanism

4-Bar Crane Mechanism
2-Stroke Internal Combustion Engine Mechanism
S-C Inversion 1

Whitworth Mechanism
S-C Inversion 2

MacPherson Strut Mechanism
S-C Inversion 3

Pump Mechanism
S-C Inversion 4

Air Compressor Mechanism
S-C Inversion 1

5-bar Oil Well Pump Mechanism
6-bar Car Hood Mechanism

6-bar Lift Mechanism

6-bar Window Mechanism

6-bar Dump Truck Mechanism

6-bar Rock Crusher Mechanism

6-bar Sewing Machine Mechanism
6-bar Watt Steam Engine Mechanism      Dual 6-bar Mechanism Collapsible Music Stand

6-bar Leg Press Mechanism               6-bar Drum Brake Mechanism

7-bar Car Window Mechanism              7-bar Car Jack Mechanism
7-bar Ross Stirling Engine Mechanism

7-bar Grabber/Extender Compound Mechanism

8-bar Scissor-Lift Mechanism

8-bar Robot Gripper Mechanism
8-Bar Straight-Line Transfer Mechanism
Multi-dof Robots

3-dof 8-bar Desk Lamp Robot

2-dof 9-bar Front-End Loader Robot

3-dof 3-RRR Parallel Robot

3-dof 3-RPR Parallel Robot
Real-World Mechanisms / Kinematic Diagrams

4-bar Glider-Rocker Mechanism

Bicycle/Human Leg 4-bar Mechanism (lock ankle)

Hettich Hinge Watt I 6-bar Mechanism

Mountain Bike Rear Suspension Mechanism
MATLAB Simulation/Animation Gallery

All of the following MATLAB graphics/animations were created by Dr. Bob at Ohio University. These are presented according to the Ohio University course they support.

ME 3011 Kinematics & Dynamics of Machines and Introduction to Vibrations

Four-Bar Mechanism

- Open Branch
- Crossed Branch

Slider-Crank Mechanism

- Right Branch
- Left Branch
Four-Bar Mechanism Coupler Curve

Slider-Crank Mechanism Coupler Curve
Slider-Crank Mechanism, Inversion 2

Geared Five-Bar Mechanism

Ross-Yoke Stirling Engine Mechanism

Involute Gear Tooth Construction
Gearbox Simulation

Planetary Gear Train Simulation

Cam/Follower Animation
Mechanical Vibrations

1-dof m-k Vibrational System, Undamped Simple Harmonic Motion, Rotating Phasors

1-dof m-k Vibrational System, Underdamped Response with Phase Plot
1-dof Pendulum Vibrational System, Simple Harmonic Motion with Phase Plots

1-dof Pendulum Vibrational System, Simple Harmonic Motion with Energy Plot
Planar 3R robot snapshot

Initial Robot Pose

Final Robot Pose

Planar 4R Kinematically-Redundant Robot Resolved-Rate Control Simulation
Spatial 4R Kinematically-Redundant Robot Resolved-Rate Control Simulation

Adept 550 4-dof SCARA Robot MATLAB Simulation/Animation
Inverse Pose Kinematics Snapshot
(male left, female right)

Human Elbow/Biceps/Triceps Dynamic Simulation (male left, female right)