Denavit-Hartenberg Notation

Jacques Denavit and Richard Hartenberg introduced this convention in 1955 in order to standardize the coordinate frames for spatial linkages.

D-H Notation - Use to solve the forward kinematics of a mechanical manipulator

D-H Frame Rules - Use to assign frames in a kinematic diagram for applying DH notation.

Frames - In a mechanical manipulator a coordinate system that the manipulator uses to know where it is and where to go. There are generally 3 types of frames

used on a mechanical manipulator:
- Base (world) frame
- User frame
- Tool frame

D-H Frame Preliminary Rules

Rule 1: Decide first the 3 views you want to project on your isometric drawing

Rule 2: Identify the center of your frames

Rule 3: Then draw your color coded arrows based on your decided 3 views.

Rule 4: Remember to make the arrows of Z and X axes easy to see for the future computations

D-H Frame Rules

Rule 1: The Z axis must be the axis of rotation for a revolute/twisting, or the direction

of translation for a prismatic joint.

Rule 2: The X axis must be perpendicular both to its own Z axis, and the Z axis of the frame before it.

Rule 3: Each X axis must intersect the Z axis of the frame before it.
Rules for complying Rule 3:
- Rotate the axis until it hits the other.
- Or translate the axis until it hits the other.

Rule 4: All frames must follow the right-hand rule.

Thumb : z
Indexer : x
Middle : y