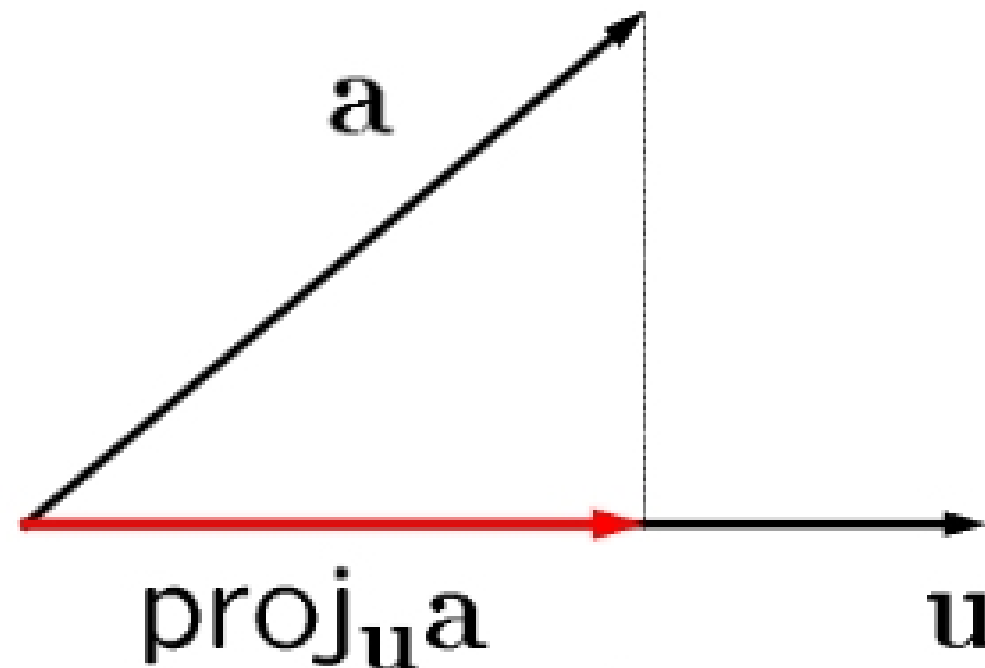


Onto 3D

- Coordinate systems
- 3-D homogeneous transformations
 - Translation, scaling, rotation
- Changes of coordinates
 - Rigid transformations

Vector Projection

- The projection of vector \mathbf{a} onto \mathbf{u} is that component of \mathbf{a} in the direction of \mathbf{u}



$$\text{proj}_{\mathbf{u}}\mathbf{a} = \frac{\mathbf{a} \cdot \mathbf{u}}{|\mathbf{u}|^2}\mathbf{u}$$

Vector Cross Product

- Definition: If $\mathbf{a} = (x_a, y_a, z_a)^T$ and
- $\mathbf{b} = (x_b, y_b, z_b)^T$, then:
$$\mathbf{c} = \mathbf{a} \times \mathbf{b}$$

\mathbf{c} is orthogonal to both \mathbf{a} and \mathbf{b}

