Assignment 1

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Download all python codes from

https://github.com/V−Gopireddy/EE3900/blob/main/Assignment1/codes/Assignment−1.py

and latex-tikz codes from

https://github.com/V−gopireddy/EE3900/blob/main/Assignment1/Assignment−1.tex

1 Vectors Q2.21

Find the unit vector in the direction of $\begin{pmatrix} 2 \\ -1 \\ -2 \end{pmatrix}$

2 Solution

Let $\mathbf{U}$ be the unit vector in the direction of given vector,

$$\mathbf{V} = \begin{pmatrix} 2 \\ -1 \\ -2 \end{pmatrix} \tag{2.0.1}$$

We get,

$$\|\mathbf{V}\| = \sqrt{(2)^2 + (-1)^2 + (-2)^2} \tag{2.0.2}$$

$$\therefore \|\mathbf{V}\| = 3 \tag{2.0.3}$$

We know the unit vector $\mathbf{U}$ in the direction of a given vector $\mathbf{V}$ is defined as below,

$$\mathbf{U} = \frac{\mathbf{V}}{\|\mathbf{V}\|} \tag{2.0.4}$$

on solving we get,

$$\therefore \mathbf{U} = \frac{1}{3}\begin{pmatrix} 2 \\ -1 \\ -2 \end{pmatrix} \tag{2.0.5}$$

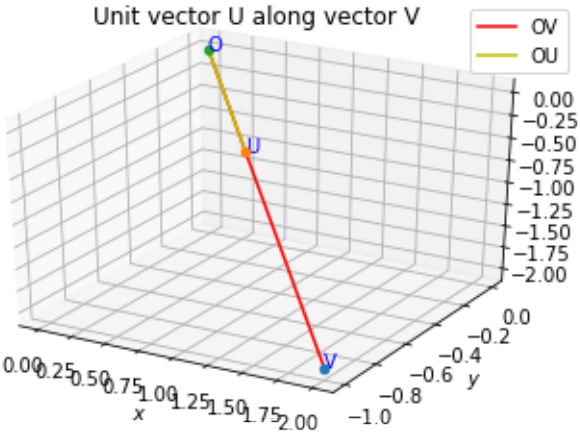

Fig. 0: Unit vector of the given vector