How to find the projection of a vector onto a plane (or a hyperplane)

Given a vector $\vec{v}$ and a vector space W:

Step 1. Find a basis $\{\vec{v_1}, \cdots, \vec{v_n}\}$ for W.

Step 2. Convert $\{\vec{v_1}, \cdots, \vec{v_n}\}$ into an orthonormal basis $\{\vec{u_1}, \cdots, \vec{u_n}\}$. (Use the Gram-Schmidt Process from below.)

Step 3. Then compute: $\text{proj}(\vec{v}, W) = \text{proj}(\vec{v}, \vec{u_1}) + \cdots + \text{proj}(\vec{v}, \vec{u_n})$.

The Gram-Schmidt Process

Given a basis $\{\vec{v_1}, \cdots, \vec{v_n}\}$ for a vector space W, we can find an orthonormal basis for W as follows:

Notation: For any vector $\vec{v}$, let's abbreviate $\dfrac{\vec{v}}{||\vec{v}||}$ by $\text{unit}(\vec{v})$.

Let $\vec{u_1} = \text{unit}[\vec{v_1}]$.
Let $\vec{u_2} = \text{unit}[\vec{v_2} - \text{proj}(\vec{v_2}, \text{span}(\vec{v_1}))] = \text{unit}[\vec{v_2} - \text{proj}(\vec{v_2}, \vec{u_1})]$.
Let $\vec{u_3} = \text{unit}[\vec{v_3} - \text{proj}(\vec{v_3}, \text{span}(\vec{v_1}, \vec{v_2}))] = \text{unit}[\vec{v_3} - \text{proj}(\vec{v_3}, \vec{u_1}) - \text{proj}(\vec{v_3}, \vec{u_2})]$.
...
Let $\vec{u_n} = \text{unit}[\vec{v_n} - \text{proj}(\vec{v_n}, \text{span}(\vec{v_1}, \cdots, \vec{v_{n-1}}))] = \text{unit}[\vec{v_n} - \text{proj}(\vec{v_n}, \vec{u_1}) - \cdots - \text{proj}(\vec{v_n}, \vec{u_{n-1}})]$.

Then $\{\vec{u_1}, \cdots, \vec{u_n}\}$ is an orthonormal basis for W.