1 | Axler6.56 Minimizing the distance to a subspace

Suppose U is a finite-dimensional subspace of V, $v \in V$, and $u \in U$. Then,

$$\|v - P_U v\| \leq \|v - u\|$$

Because we often end up having to find the minimal $v - u$ where $u \in U$, this result makes linear algebra applicable to numerous real-world applications.

1.1 | Results

1.2 | Proof