Subspace Sums

1 Why

2 Definition

The *sum* of two subspaces is the span of their union. So then the sum of two subspaces is also a subspace. If the intersection of two subspaces is the zero subspace, we call the sum a *direct sum*.

2.1 Notation

Let U and V be subspaces of a vector space. We denote the sume of U and V by $U + V$. We can express

$$U + V = \textbf{span}(U + V).$$

Let $\mathbf{0}$ denote the zero vector. If $S_1 \cap S_2 = \{\mathbf{0}\}$

TODO: something about uniqueness of representation