0.1 Outer product

0.1.1 The outer product is a bilinear map

This is a bilinear map from two vectors from the same vector space to another vector space.

$V \times V \to V$

0.1.2 Calculating the outer product

$u \otimes v = w$

$w_{ij} = u_i v_j$

0.1.3 The dimensions of the tensor outer product

$\dim(V \otimes W) = \dim V \times \dim W$

0.1.4 Outer product on the complex numbers

0.1.5 Relation between the dot product and outer product

The dot product in the trace of the outer product.