

Chapter will cover eigenvectors and eigenvalues,

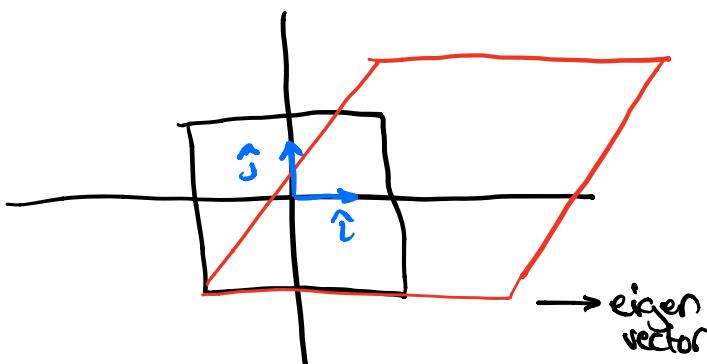
- eigenvectors - vectors which are only stretched by their corresponding transformation
- eigenvalues - scalar quantity by which the corresponding eigenvector was stretched.

Will cover,

- geometry of eigenvector/value
- how to calculate vector/val
- large dimension eigensystems
 - ↳ computationally how to solve
- ⇒ Google PageRank.

Eigen - loosely translates to "characteristic" in german.

Visualizing transformations on a Vector Space



Eigenvectors - vectors which do not change (i.e. stay in same line) except for stretch.

(*) Pure shear means no scaling, rotation in addition.

- i.e. the area isn't changed $\det(M) = \pm 1$.

There are many operations you can perform with matrix operations,

- rotations
- shears
- stretches
- inversions
- mirroring

You can frame the result of those transformations in terms of a singular vector

but for some purposes it is more useful to consider the effect on all vectors.