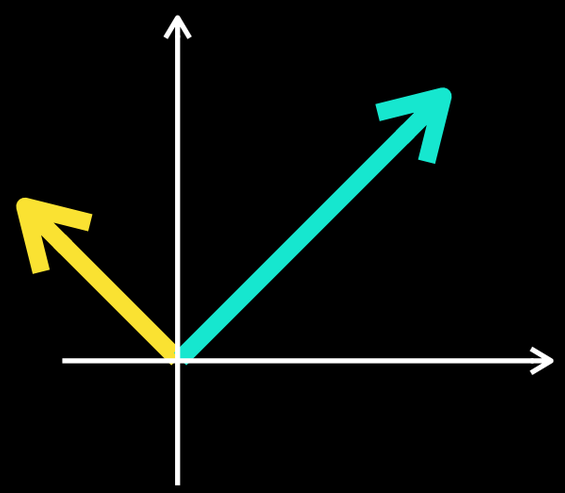
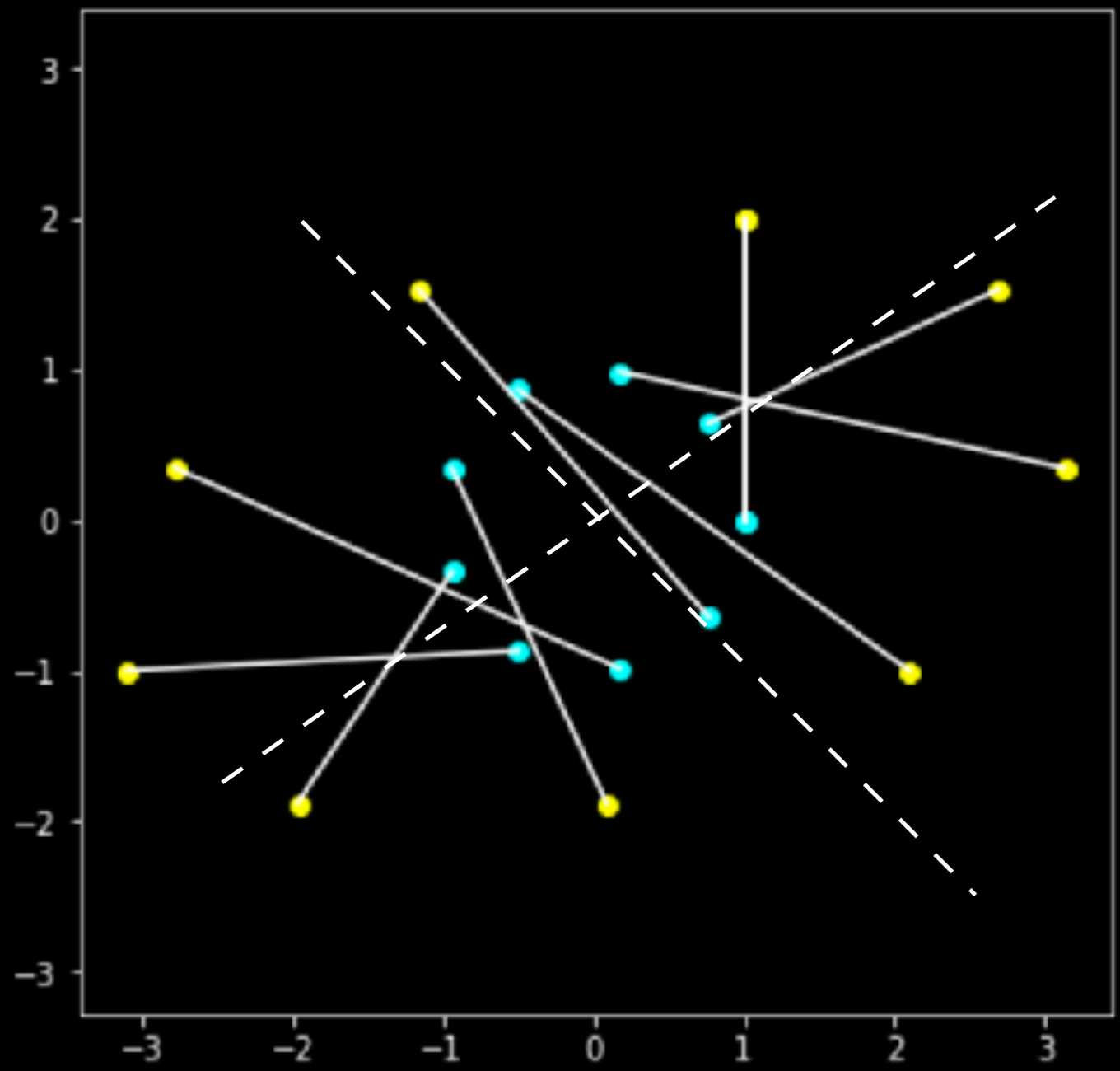
Eigenvectors

Linear Algebra Essentials



$$M = \begin{bmatrix} 1 & 3 \\ 2 & 0 \end{bmatrix}$$

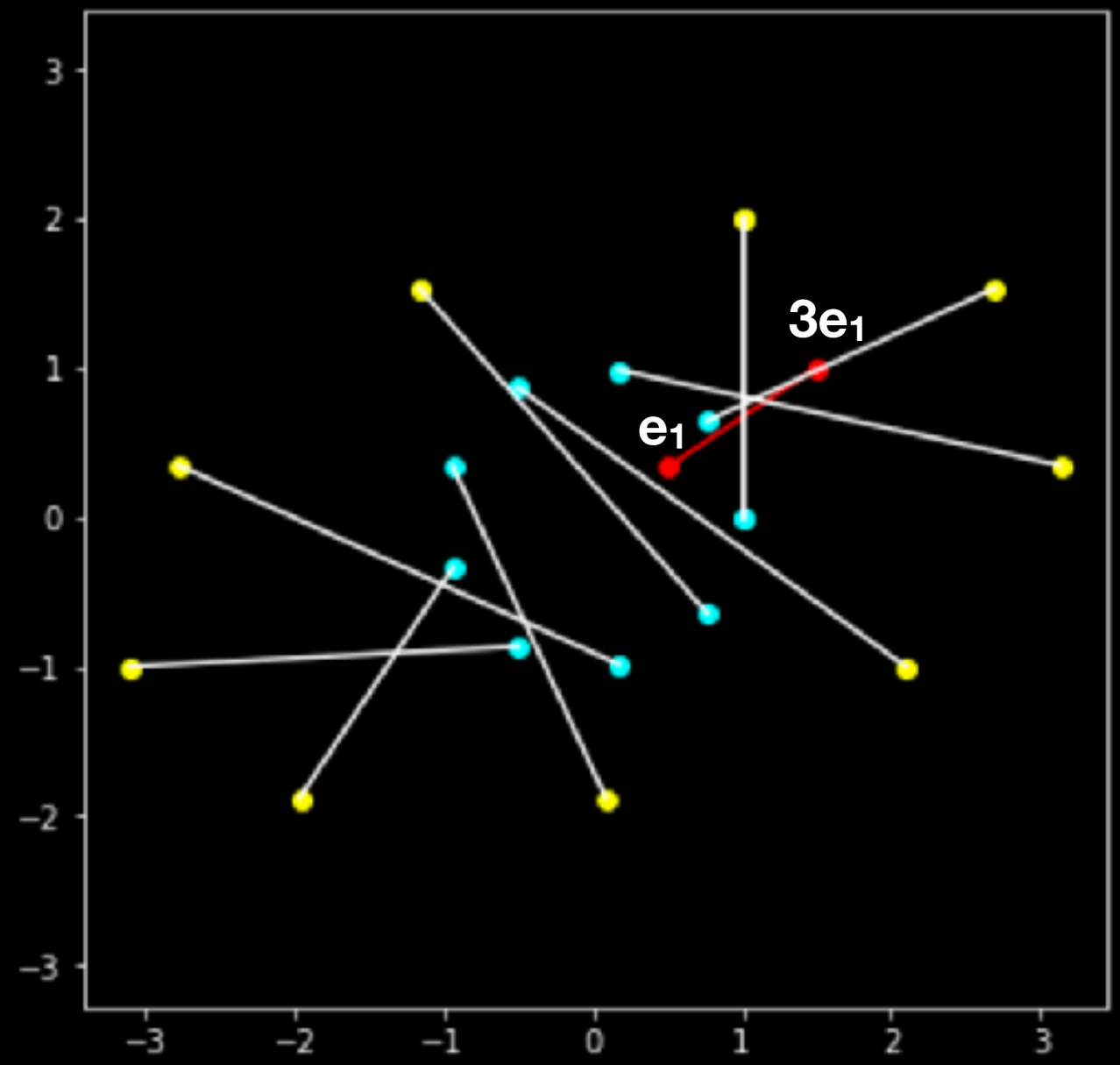


Eigenvectors

$$M = \begin{bmatrix} 1 & 3 \\ 2 & 0 \end{bmatrix}$$

$$e_1 = \begin{bmatrix} 1/2 \\ 1/3 \end{bmatrix}$$

$$M \cdot e_1 = \begin{bmatrix} \frac{1}{2} + 1 \\ 1 + 0 \end{bmatrix} = 3e_1$$

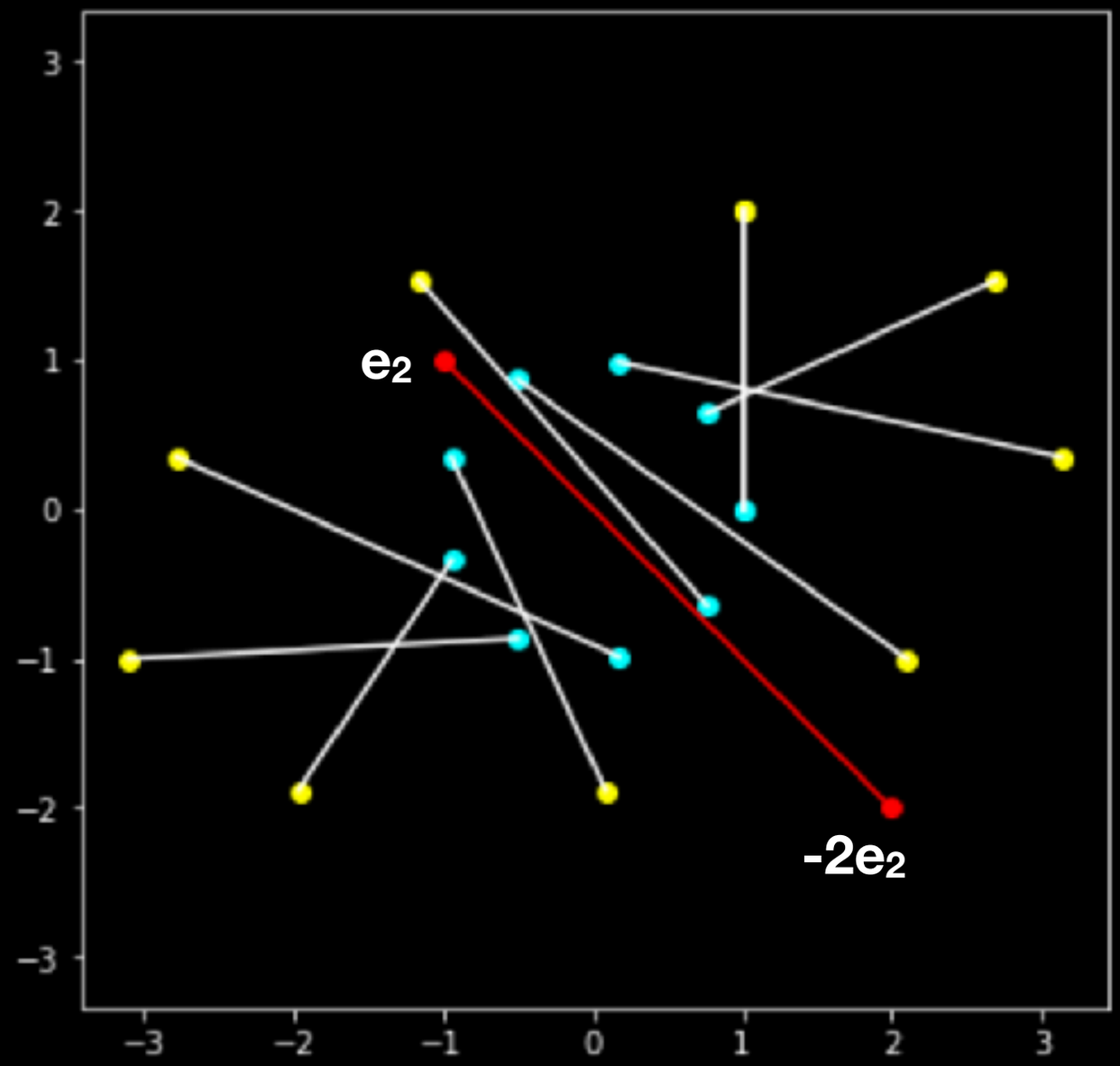


Eigenvectors

$$M = \begin{bmatrix} 1 & 3 \\ 2 & 0 \end{bmatrix}$$

$$e_2 = \begin{bmatrix} -1 \\ 1 \end{bmatrix}$$

$$M \cdot e_2 = \begin{bmatrix} -1+3 \\ -2+0 \end{bmatrix} = -2e_2$$

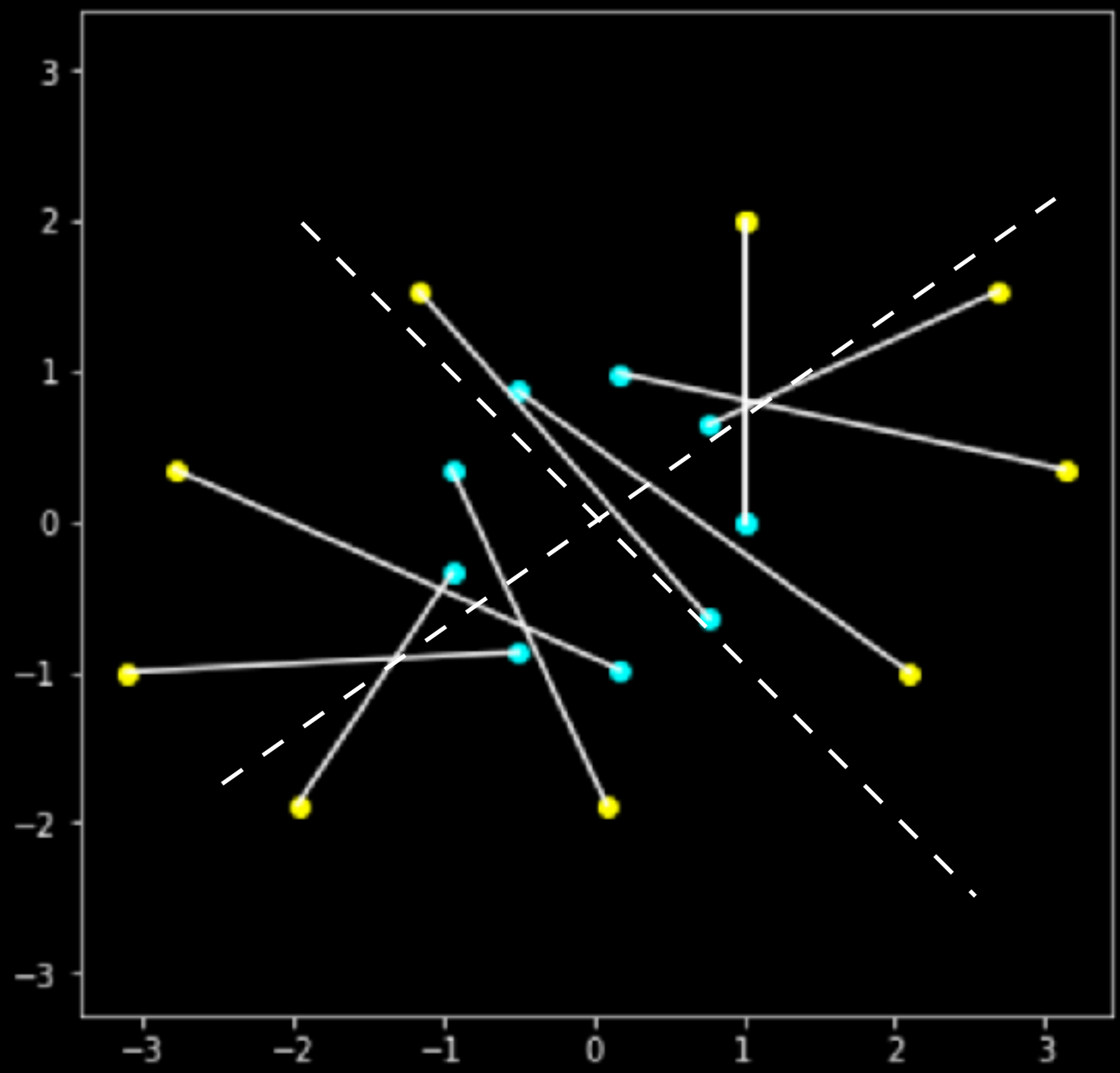


$$M = \begin{bmatrix} 1 & 3 \\ 2 & 0 \end{bmatrix}$$

$$Mx = \lambda x$$

x - is eigenvector
of matrix M

ƛ - is eigenvalue
of matrix M

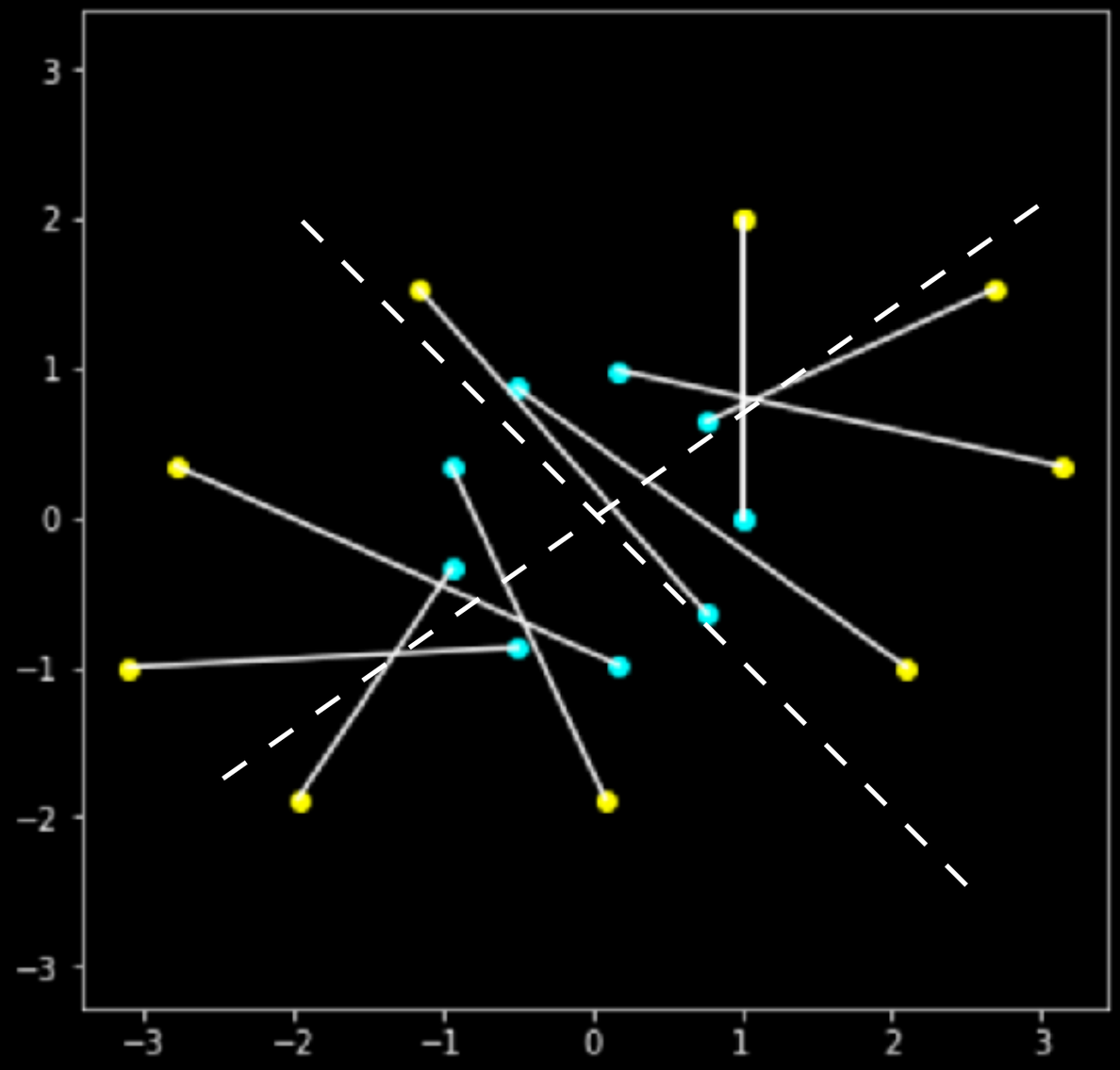


Eigenvalues

$$det(A) = \prod_i \lambda_i$$

$$det\left(\begin{bmatrix} 1 & 3 \\ 2 & 0 \end{bmatrix}\right) = -6$$

$$\lambda_1 \cdot \lambda_2 = 3 \cdot (-2) = -6$$



y = αx, where x is eigenvector

$$Ay = A \cdot \alpha x = \alpha A x = \alpha(\lambda x) = \lambda(\alpha x) = \lambda y$$