

Applying SVD to X :

$$\begin{matrix} & & |V| \\ & & \left[\begin{array}{c} \\ \\ \\ \end{array} \right] \\ & & X \\ & & \left[\begin{array}{c} \\ \\ \\ \end{array} \right] \end{matrix} = \begin{matrix} & & |V| \\ & & \left[\begin{array}{c} | \\ u_1 \\ | \end{array} \right] \\ & & u_2 \\ & & \left[\begin{array}{c} | \\ \\ \end{array} \right] \end{matrix} \cdots \begin{matrix} & & |V| \\ & & \left[\begin{array}{c} \\ \\ \\ \end{array} \right] \\ & & \sigma_1 \\ & & 0 \\ & & \left[\begin{array}{c} \\ \\ \end{array} \right] \\ & & \vdots \end{matrix} \begin{matrix} & & |V| \\ & & \left[\begin{array}{c} \\ \\ \\ \end{array} \right] \\ & & \sigma_2 \\ & & \vdots \\ & & \left[\begin{array}{c} \\ \\ \end{array} \right] \\ & & \ddots \end{matrix} \begin{matrix} & & |V| \\ & & \left[\begin{array}{c} \\ \\ \\ \end{array} \right] \\ & & - \\ & & v_1 \\ & & \left[\begin{array}{c} \\ \\ \end{array} \right] \\ & & - \\ & & v_2 \\ & & \left[\begin{array}{c} \\ \\ \end{array} \right] \\ & & \vdots \end{matrix}$$