2 1) Initially there is a large difference b/w eigenvalues and decreases fastly and after around 10 eigenvalues, others are very small. We can discard them and still preserve more than 90% features using only first 10 eigenvalues.

2) Yes, they are orthonormal. To verify, U^TU and $V_h V_h^T$ should be Identity matrix I as $\begin{cases} u_i^T u_j = 1 & \text{for } i = j \\ u_j^T u_j = 0 & \text{for } i \neq j \end{cases}$ and similar with V_h.

Scanned with CamScanner