# chatsonic

Yes, it is necessary to center the data before multiplying it with $\mathbf W\_\mathrm{PCA}$ to get the 2D (non-whitened) PCA projection $\mathbf Y$. This is because $\mathbf W\_\mathrm{PCA} = \mathbf D^{-1/2} \mathbf E^\top$, and $\mathbf E$ is only the eigenvectors of the centered data. Without centering, the PCA projection would be distorted.