Matrix $M_t$ contains $c$ column vectors, $m_1$ through $m_c$.

\[ M_t = \begin{bmatrix} m_1 & m_2 & \ldots & m_c \end{bmatrix} \]

Taking the SVD of $M_t$ gives us

\[ M_t = [\hat{U}_t \  \tilde{U}_t] \begin{bmatrix} \hat{\Sigma}_t & 0 \\ 0 & \tilde{\Sigma}_t \end{bmatrix} [\hat{V}_t \  \tilde{V}_t]^H \]

where $\hat{U}_t$ contains the $k$ left singular vectors of $M_t$ corresponding to its largest singular values, which are the orthonormal basis vectors of the desired subspace.