data onto a line passing through the sample mean.  $\vec{x} = \vec{m} + a\vec{e} \eqno(3)$ 

 $\vec{x_k} = m + a_k \vec{e}$ 

For a one-dimensional representation of the data set let us look at a projection of the

where  $\vec{e}$  is a unit vector in the direction of the line.

here 
$$e$$
 is a unit vector in the direction of the line.