



Principal Component Analysis

CB2030

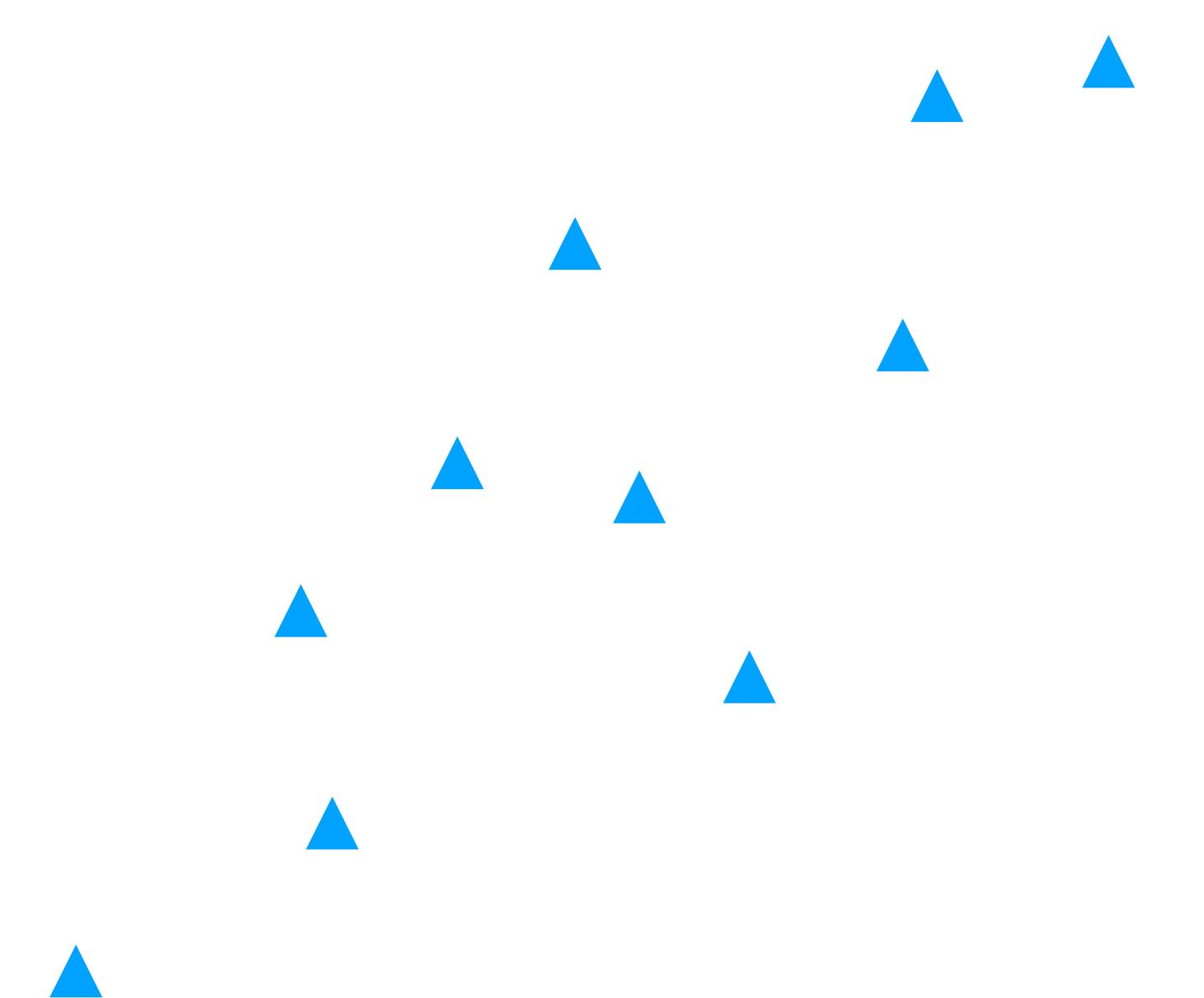
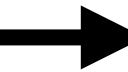
Lukas Käll, KTH



Height² [cm²]



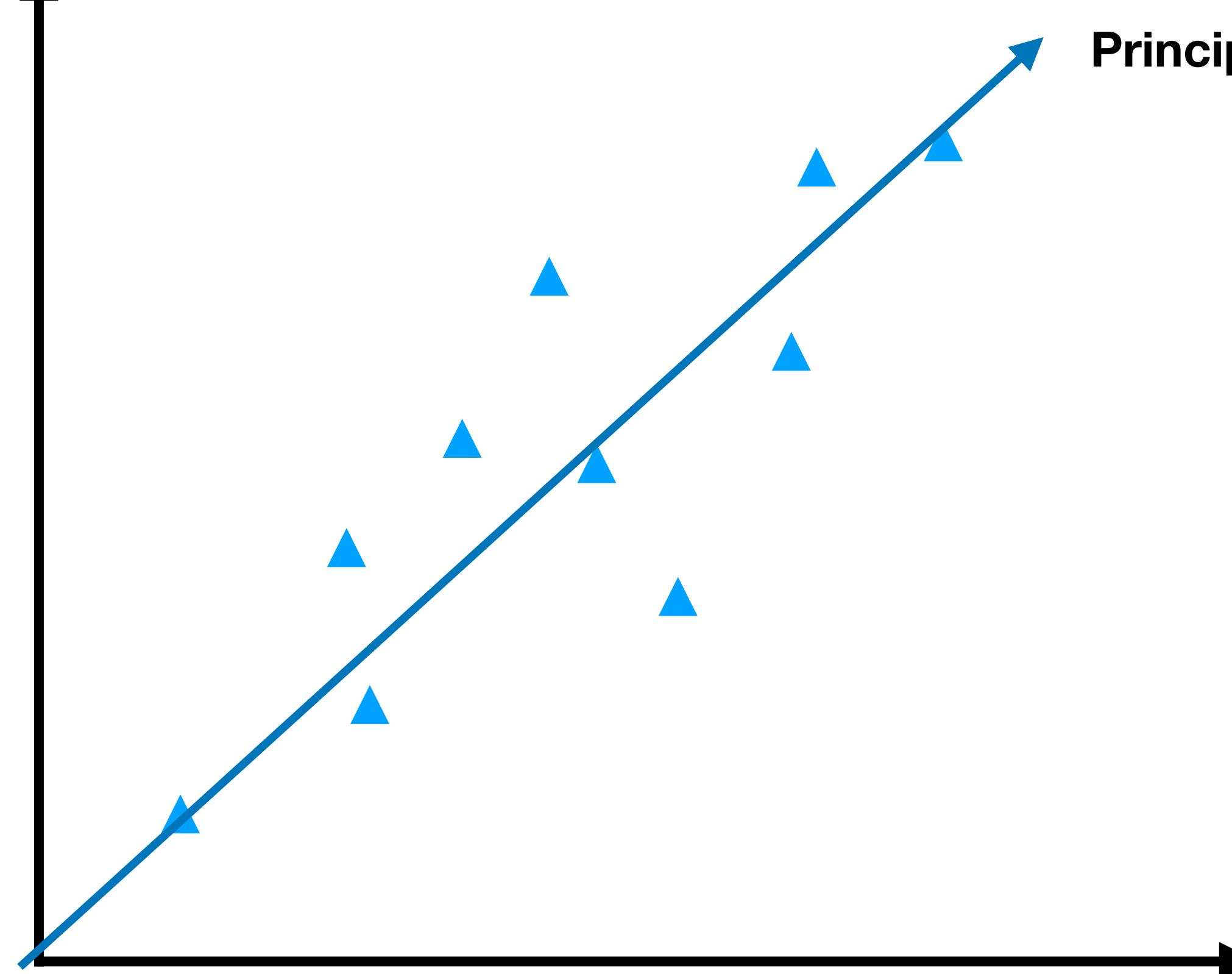
Mass [kg]



Height² [cm²]



Principal Component 1



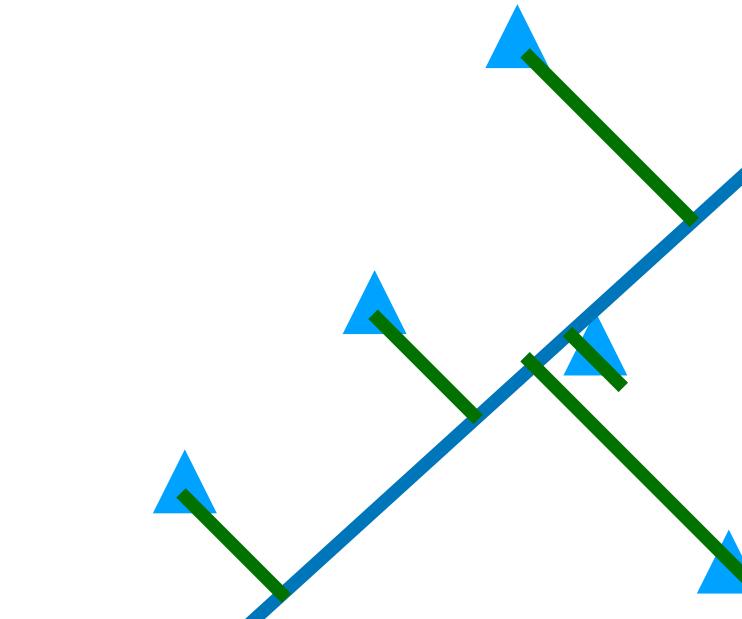
Mass [kg]

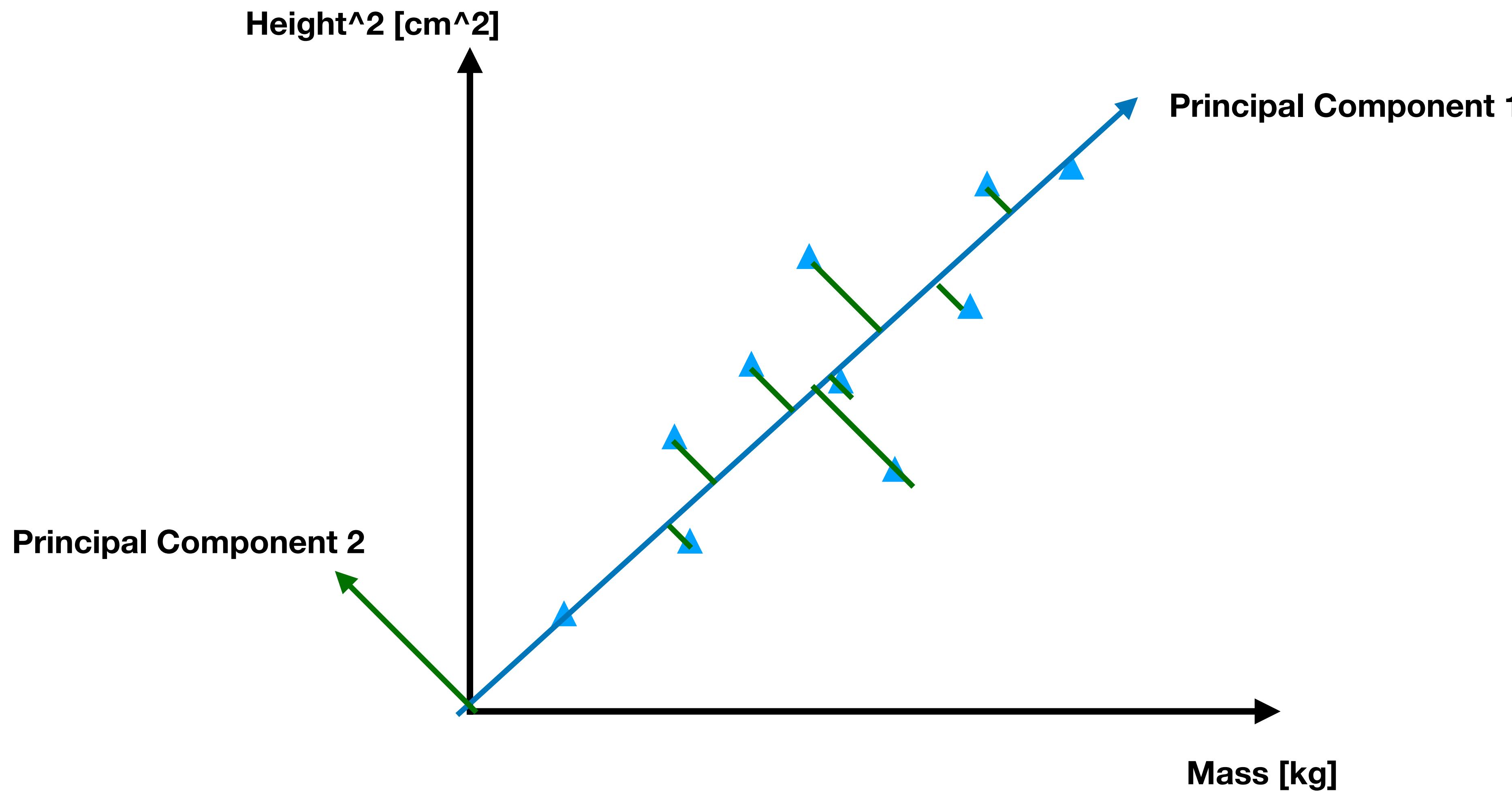
Height² [cm²]



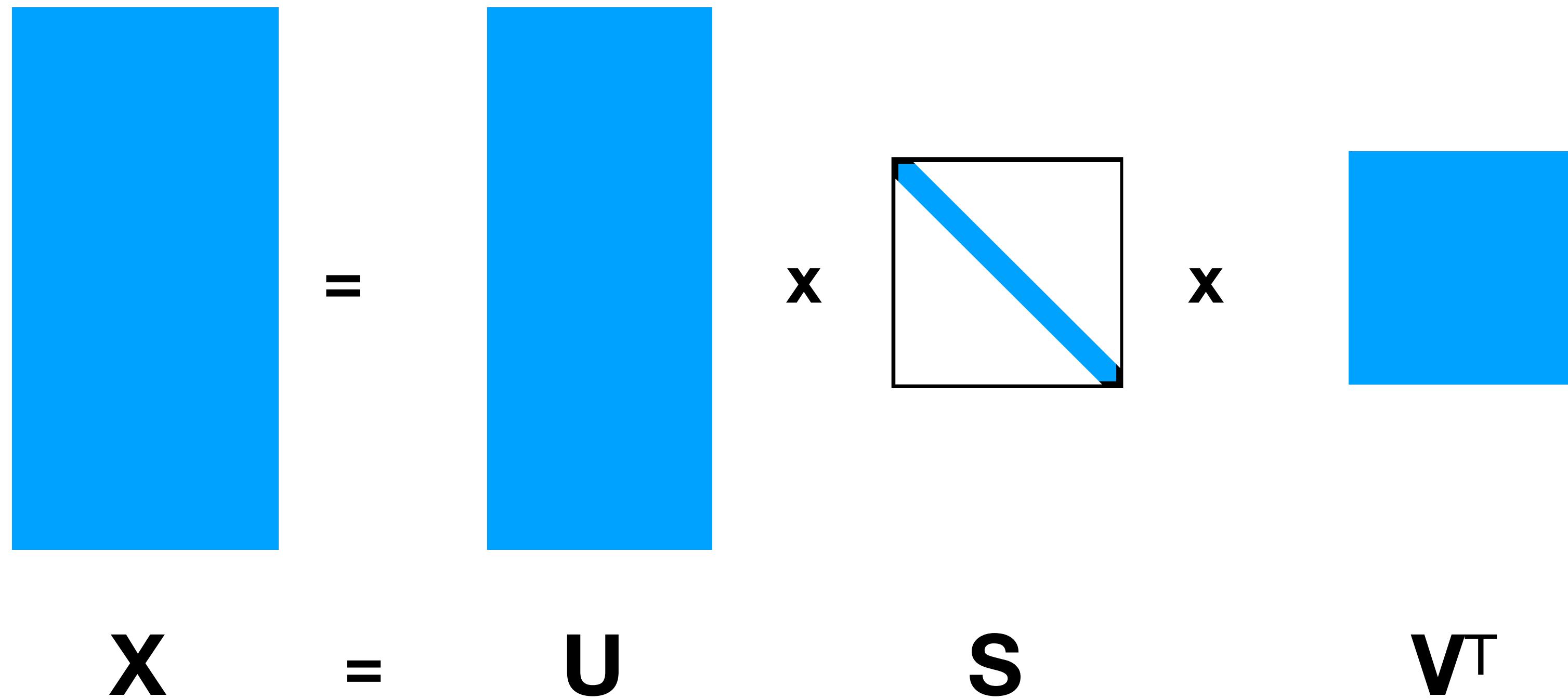
Principal Component 1

Mass [kg]





Matrix Decomposition with Singular Value Decomposition (SVD)

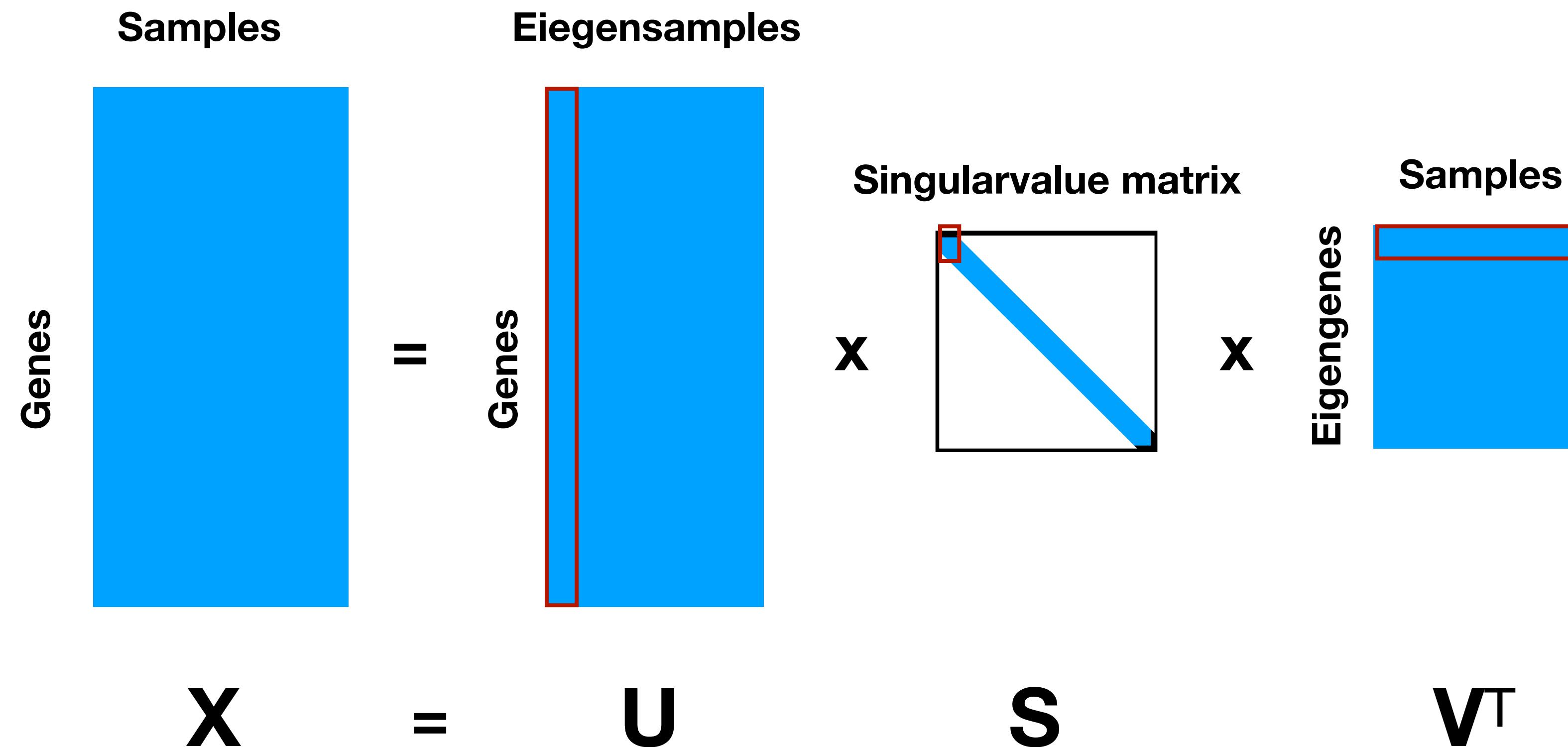
$$\mathbf{X} = \mathbf{U} \mathbf{S} \mathbf{V}^T$$


Matrix Decomposition with Singular Value Decomposition (SVD)

$$\mathbf{X} = \mathbf{U} \mathbf{S} \mathbf{V}^T$$

The diagram illustrates the Singular Value Decomposition (SVD) of a matrix \mathbf{X} . The matrix \mathbf{X} is shown as a blue rectangle. It is decomposed into three components: \mathbf{U} , \mathbf{S} , and \mathbf{V}^T . The matrix \mathbf{U} is represented by a blue rectangle with a red vertical border on its left side. The matrix \mathbf{S} is shown as a white square containing a blue diagonal line from top-left to bottom-right. The matrix \mathbf{V}^T is represented by a blue rectangle with a red horizontal border at the top. The decomposition is indicated by the equation $\mathbf{X} = \mathbf{U} \mathbf{S} \mathbf{V}^T$.

Matrix Decomposition with Singular Value Decomposition (SVD)



Eigensample = representation of combinations of genes, describes how samples vary over the genes

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Examples of visualisation using PCA

