

$$\begin{array}{ccccccccccc}
 \mathbf{X} & & \vec{\mathbf{W}}_1 & & \vec{\mathbf{W}}_2 & & \vec{\mathbf{W}}_3 & & \vec{\mathbf{W}}_c & & \epsilon \\
 \begin{array}{c} \text{Brain MRI slice 1} \\ \text{Brain MRI slice 2} \\ \text{Brain MRI slice 3} \end{array} & = & S_1 \times \begin{array}{c} \text{Brain MRI slice 1} \\ \text{Brain MRI slice 2} \\ \text{Brain MRI slice 3} \end{array} & + & S_2 \times \begin{array}{c} \text{Brain MRI slice 1} \\ \text{Brain MRI slice 2} \\ \text{Brain MRI slice 3} \end{array} & + & S_3 \times \begin{array}{c} \text{Brain MRI slice 1} \\ \text{Brain MRI slice 2} \\ \text{Brain MRI slice 3} \end{array} & \dots & + & S_c \times \begin{array}{c} \text{Brain MRI slice 1} \\ \text{Brain MRI slice 2} \\ \text{Brain MRI slice 3} \end{array} & + & \begin{array}{c} \text{Noise slice 1} \\ \text{Noise slice 2} \\ \text{Noise slice 3} \end{array}
 \end{array}$$

Diagram illustrating a linear combination of brain MRI slices. The input \mathbf{X} (a stack of three brain MRI slices) is equal to the sum of weighted slices $S_1 \times \vec{\mathbf{W}}_1$, $S_2 \times \vec{\mathbf{W}}_2$, $S_3 \times \vec{\mathbf{W}}_3$, ..., $S_c \times \vec{\mathbf{W}}_c$, plus a noise term ϵ . Each $\vec{\mathbf{W}}_i$ represents a set of three brain MRI slices, and S_i represents a scalar weight for each slice.