

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

Diagram illustrating a linear combination of brain MRI slices. The input image \mathbf{X} is equal to the sum of weighted slices $S_1 \times \vec{\mathbf{W}}_1 + S_2 \times \vec{\mathbf{W}}_2 + S_3 \times \vec{\mathbf{W}}_3 + \dots + S_N \times \vec{\mathbf{W}}_N$, plus a noise term ϵ . Each slice is represented by a vertical stack of three brain MRI slices. The weights $S_1, S_2, S_3, \dots, S_N$ are scalar values applied to the corresponding slices.