First, let us obtain the function for a two-dimensional array. Element $[i_1][i_2]$ is preceded by i_2 columns of size u_1 each and by i_1 elements with the same second index. So, the mapping formula is

$$map\,(i_1, i_2) = i_2 u_1 + i_1$$

In a three-dimensional array, element $[i_1][i_2][i_3][i_4]$ is preceded by $i_3 u_2 u_1$ elements with smaller third index, $i_2 u_1$ elements with the same third index but smaller second index and i_1 elements that have the same second and third indexes but smaller third index. So,

$$map\,(i_1, i_2, i_3) = i_3 u_2 u_1 + i_2 u_1 + i_1$$