Definition (**Special** orthogonal group SO(n))
The special orthogonal group of order n, written SO(n), is the group of $n \times n$ square matrices that satisfy

and $det(\mathbf{M}) = 1$.

 $\mathbf{M}\mathbf{M}^{\intercal} = \mathbf{M}^{\intercal}\mathbf{M} = 1$,