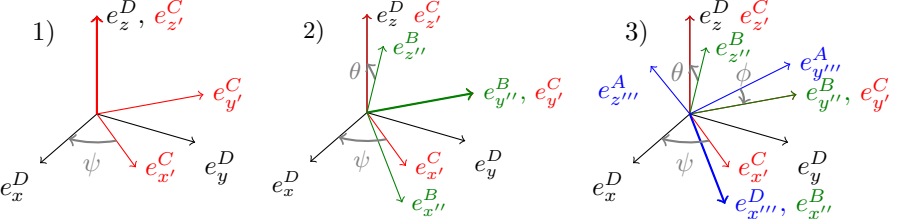

$$
\begin{aligned}
\mathbf{C}_{AD} &= \mathbf{C}_{AB}\mathbf{C}_{BC}\mathbf{C}_{CD} \quad \Rightarrow \quad {}^{A}\mathbf{r} = \mathbf{C}_{AD}\,{}^{D}\mathbf{r} \\
&= \begin{pmatrix} 1 & 0 & 0 \\ 0 & \cos\phi & -\sin\phi \\ 0 & \sin\phi & \cos\phi \end{pmatrix}
\begin{pmatrix} \cos\theta & 0 & \sin\theta \\ 0 & 1 & 0 \\ -\sin\theta & 0 & \cos\theta \end{pmatrix}
\begin{pmatrix} \cos\psi & -\sin\psi & 0 \\ \sin\psi & \cos\psi & 0 \\ 0 & 0 & 1 \end{pmatrix} \\
&= \begin{pmatrix} \cos\theta\cos\psi & -\cos\theta\sin\psi & \sin\theta \\ \cos\phi\sin\psi + \cos\psi\sin\phi\sin\theta & \cos\phi\cos\psi - \sin\phi\sin\theta\sin\psi & -\cos\theta\sin\phi \\ \sin\phi\sin\psi - \cos\phi\cos\psi\sin\theta & \cos\psi\sin\phi + \cos\phi\sin\theta\sin\psi & \cos\phi\cos\theta \end{pmatrix}
\end{aligned}
$$