1 Transforming Twists and Spatial Accelerations

$$\begin{aligned}\begin{pmatrix}\omega\\ \mathbf{v}\end{pmatrix}_B &= \begin{pmatrix}\mathbf{R} & \mathbf{0}\\ \mathbf{R}\tilde{\mathbf{r}}^T & \mathbf{R}\end{pmatrix}\begin{pmatrix}\omega\\ \mathbf{v}\end{pmatrix}_A\\ &= \begin{pmatrix}\mathbf{R}\omega_A\\ \mathbf{R}\mathbf{v}_A - \mathbf{R}(\mathbf{r}\times\omega_A)\end{pmatrix}\end{aligned}$$

with

$$\tilde{\mathbf{r}} = \begin{pmatrix}0 & -r_z & r_y\\ r_z & 0 & -r_x\\ -r_y & r_x & 0\end{pmatrix}$$

and

$\mathbf{r}$	–	Translation from frame A to frame B
$\mathbf{R}$	–	Rotation from frame A to frame B
ω	–	Angular velocity
$\mathbf{v}$	–	Linear velocity

2 Transforming Wrenches

$$\begin{aligned}\begin{pmatrix}\tau\\ \mathbf{f}\end{pmatrix}_B &= \begin{pmatrix}\mathbf{R} & \mathbf{0}\\ \mathbf{R}\tilde{\mathbf{r}}^T & \mathbf{R}\end{pmatrix}^{-T}\begin{pmatrix}\tau\\ \mathbf{f}\end{pmatrix}_A\\ &= \begin{pmatrix}\mathbf{R} & \mathbf{R}\tilde{\mathbf{r}}^T\\ \mathbf{0} & \mathbf{R}\end{pmatrix}\begin{pmatrix}\tau\\ \mathbf{f}\end{pmatrix}_A\\ &= \begin{pmatrix}\mathbf{R}\tau_A - \mathbf{R}(\mathbf{r}\times\mathbf{f}_A)\\ \mathbf{R}\mathbf{f}_A\end{pmatrix}\end{aligned}$$

with

τ	–	Torque
$\mathbf{f}$	–	Force