LIE GROUP NOTATIONS

position – orientation	standard representation $\boldsymbol{g} = \begin{pmatrix} \boldsymbol{R} & \boldsymbol{u} \\ 0 & 1 \end{pmatrix} \in SE(3)$	Adjoint and coAdjoint representation $Ad_{\boldsymbol{g}} = \begin{pmatrix} \boldsymbol{R} & 0 \\ \tilde{\boldsymbol{u}}\boldsymbol{R} & \boldsymbol{R} \end{pmatrix}, Ad^*_{\boldsymbol{g}} = \begin{pmatrix} \boldsymbol{R} & \tilde{\boldsymbol{u}}\boldsymbol{R} \\ 0 & \boldsymbol{R} \end{pmatrix} \in \mathbb{R}^{6\times 6}$
velocity (body frame)	Lie Algebra element $\boldsymbol{g}^{-1}\dot{\boldsymbol{g}} = \hat{\boldsymbol{\eta}} = \begin{pmatrix} \tilde{\boldsymbol{w}} & \boldsymbol{v} \\ 0 & 0 \end{pmatrix} \in \mathfrak{se}(3)$ twist vector $\boldsymbol{\eta} = \begin{bmatrix} \boldsymbol{w} \\ \boldsymbol{v} \end{bmatrix} \in \mathbb{R}^{\boldsymbol{6}}$	adjoint and coadjoint map $ad_{\boldsymbol{\eta}} = \begin{pmatrix} \tilde{\boldsymbol{w}} & 0 \\ \tilde{\boldsymbol{v}} & \tilde{\boldsymbol{w}} \end{pmatrix}, ad^*_{\boldsymbol{\eta}} = \begin{pmatrix} \tilde{\boldsymbol{w}} & \tilde{\boldsymbol{v}} \\ 0 & \tilde{\boldsymbol{w}} \end{pmatrix} \in \mathbb{R}^{6\times 6}$ Where $\tilde{\boldsymbol{a}} = \begin{pmatrix} 0 & -z & y \\ z & 0 & -x \\ -y & x & 0 \end{pmatrix}$
strain (body frame)	Lie Algebra element $\boldsymbol{g}^{-1}\boldsymbol{g}' = \hat{\boldsymbol{\xi}} = \begin{pmatrix} \tilde{\boldsymbol{k}} & \boldsymbol{p} \\ 0 & 0 \end{pmatrix} \in \mathfrak{se}(3)$ twist vector $\boldsymbol{\xi} = \begin{bmatrix} \boldsymbol{k} \\ \boldsymbol{p} \end{bmatrix} \in \mathbb{R}^{\boldsymbol{6}}$	adjoint and coadjoint map $ad_{\boldsymbol{\xi}} = \begin{pmatrix} \tilde{\boldsymbol{k}} & 0 \\ \tilde{\boldsymbol{p}} & \tilde{\boldsymbol{k}} \end{pmatrix}, ad^*_{\boldsymbol{\xi}} = \begin{pmatrix} \tilde{\boldsymbol{k}} & \tilde{\boldsymbol{p}} \\ 0 & \tilde{\boldsymbol{k}} \end{pmatrix} \in \mathbb{R}^{6\times 6}$

- J. M. Selig. *Geometric Fundamentals of Robotics*. Monographs in Computer Science. Springer New York, 2007.