Robotics, Vision & Control notation in LaTex

Peter Corke

Pose

```
$\pose$  $\pose[A]_B$  \\
$\pose[A]_B \oplus \pose[B]_C \ominus
    \pose[C]_D$  \\
$\pose \sbullet \vec{v}$
```

$$\xi \quad {}^{A}\xi_{B}$$
$${}^{A}\xi_{B} \oplus {}^{B}\xi_{C} \ominus {}^{C}\xi_{D}$$
$$\xi \bullet \boldsymbol{v}$$

Coordinate frame

```
$\cframe{A}$
```

$$\{A\}$$

Point

```
$\point{P}$
```

$$\mathrm{P}$$

Matrices

```
$\mat{R}$  $\mat[A]R$  $\mat[A]{R}_B$
    \\
$\dmat{R}$ \\
$\emat{R}$ \\
$\matfn{J}{\vec{q}}$
    $\matfn[0]{J}{\vec{q}}$ \\
$\mat{0}_{2 \times 3}$   $\mat{1}_{3
    \times 3}$
```

$$\boldsymbol{R} \quad {}^{A}\boldsymbol{R} \quad {}^{A}\boldsymbol{R}_{B}$$
$$\dot{\boldsymbol{R}}$$
$$\hat{\boldsymbol{R}}$$
$$\boldsymbol{J}(\boldsymbol{q}) \quad {}^{0}\boldsymbol{J}(\boldsymbol{q})$$
$$\boldsymbol{0}_{2\times 3} \quad \boldsymbol{1}_{3\times 3}$$

Vectors

```
$\vec{v}$  $\vec[A]{v}$  \\
$\dvec{v}$  $\dvec[A]{v}$  \\
$\ddvec{v}$  $\ddvec[A]{v}$  \\
$\evec{v}$  $\evec[A]{v}$  \\
$\bvec{v}$  $\bvec[A]{v}$ \\
$\hvec{v}$  $\hvec[A]{v}$
```

$$\boldsymbol{v} \quad {}^{A}\boldsymbol{v}$$
$$\dot{\boldsymbol{v}} \quad {}^{A}\dot{\boldsymbol{v}}$$
$$\ddot{\boldsymbol{v}} \quad {}^{A}\ddot{\boldsymbol{v}}$$
$$\hat{\boldsymbol{v}} \quad {}^{A}\hat{\boldsymbol{v}}$$
$$\bar{\boldsymbol{v}} \quad {}^{A}\bar{\boldsymbol{v}}$$
$$\tilde{\boldsymbol{v}} \quad {}^{A}\tilde{\boldsymbol{v}}$$

Quaternions

```
$\quat{q} \circ \quat{p}$
```

$\breve{q} \circ \breve{p}$

Unit quaternions

```
$\uquat[A]{q}_B \circ \uquat[B]{q}_C$
```

${}^{A}\mathring{q}_B \circ {}^{B}\mathring{q}_C$

Skew-symmetric matrices

```
$\skx{v}$  $\iskx{\mat{A}}$ \\
$\sk{v}$  $\isk{\mat{A}}$
```

$[v]_\times \vee_\times (\boldsymbol{A})$
$[v] \vee (\boldsymbol{A})$

Groups and spaces

```
$\SO{3}, \SE{3}$  \\
$\so{3}, \se{3}$  \\
text mode \SO{3} \\
$\R$ \\
$\cspace$
```

$\mathbf{SO}(3), \mathbf{SE}(3)$
$\mathbf{so}(3), \mathbf{se}(3)$
text mode $\mathbf{SO}(3)$
$\mathbb{R}$
$\mathcal{C}$

Code

```
\begin{Code}
[x,e] = eig(A);
\end{Code}

\begin{CodeNum}
[x,e] = eig(A);
z = x(:,2);
\end{CodeNum}
```

```
[x,e] = eig(A);
```

```
1 [x,e] = eig(A);
2 z = x(:,2);
```

Other operators

```
$\theta_1 \circleddash \theta_2$ \\
```

$\theta_1 \ominus \theta_2$

Units

```
The object was 12\mm\ across,
accelerated at 2.3\unit{m s^{-2}},
the servo interval was 12\ms,
and the angle spanned 30\deg.
```

The object was 12 mm across, accelerated at 2.3 ms^{-2}, the servo interval was 12 ms, and the angle spanned 30°.

Numbers and coordinates

```
$\sci{5}{-2}$  \\
$\coord{1}{2}, \vector{1}{2}{3}$
```

$5{\cdot}10^{-2}$
$(1,\ 2), (1,\ 2,\ 3)$

Miscellaneous

```
Here is a sentence running into an
    equation
\[
y = x^{2} \fullstop
\]
```

Here is a sentence running into an equation

$$y = x^2 \ .$$