Obstacle Avoidance Framework based on Reach Sets

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$$\label{eq:spaceCassificationFunction}
SpaceClassification: y \in \emph{Space} \mapsto s \in \{Free, Restricted, Occupied, Uncertain \}$$

$$\label{eq:UASNonlinearModelSimple}
\begin{aligned}
\frac{\text{d} x}{\text{d} time} &= v\cos(pitch)\cos(yaw);\\
\frac{\text{d} y}{\text{d} time} &= v\cos(pitch)\sin(yaw);\\
\frac{\text{d} z}{\text{d} time} &= -v\sin(pitch);\\
\end{aligned}\\\quad\quad
\begin{aligned}
\frac{\text{d} roll}{\text{d} time} &= \omega\_{roll};\\
\frac{\text{d} pitch}{\text{d} time} &= \omega\_{pitch};\\
\frac{\text{d} yaw}{\text{d} time} &= \omega\_{yaw};\\
\end{aligned}$$

$$\label{eq:ourBuffer}
Buffer = \left\{
movement(j):
\begin{aligned}
&movement(j)\in Movement Set (eq. \ref{eq:OurMovementSet}),\\
& j \in 1\dots n, n \in N^+
\end{aligned}
\right\}$$