

# Nomenclature

## Symbols

$p$	Position	[m]
$v$	Velocity	[m/s]
$q$	Quaternion	[rad]
$\omega$	Angular Velocity	[rad/s]
$\theta$	Tilt-angle	[rad]
$\alpha$	Angle form horizontal plane	[rad]
$\psi$	Yaw-angle	[rad]
$f$	Force	[N]
$m$	Torque	[N m]
$M$	Mass	[kg]
$\mathbf{J}$	Rotational Inertia	[kg m <sup>2</sup> ]
$\mathbf{R}$	Rotation Matrix	
$\mathbf{W}$	Quaternion Rate Matrix	
$t$	Continuous Time	[s]
$k$	Discrete time	
$x$	State	
$u$	Input	
$A$	State matrix	
$B$	Input matrix	
$Q$	State weighting matrix	
$P$	Final state weighting matrix	
$R$	Input weighting matrix	
$e$	Unit vector	
$fn$	Force function	
$gn$	Torque function	
$hn$	Aerodynamic force function	
$rn$	Aerodynamic torque function	
$\times$	Cross Product	
$\delta$	Deviation	
$\Sigma$	Sum	
$\Delta$	Difference	
$sat$	Saturation	

## Indices

<i>air</i>	Aerodynamic
<i>I</i>	Inertial Frame
<i>B</i>	Body Frame
<i>tot</i>	Total
<i>x</i>	x-Component
<i>y</i>	y-Component
<i>z</i>	z-Component
<i>x, y</i>	x-y-plane
<i>r</i>	Tracking reference
<i>ref</i>	Reference with respect to wing
<i>e</i>	Error
<i>ini</i>	Initial
<i>des</i>	Desired
<i>prop</i>	Propeller
<i>props</i>	Left and right propeller
<i>prop, l</i>	Left propeller
<i>prop, r</i>	Right propeller
<i>flaps</i>	Left and right flap
<i>flap, l</i>	Left flap
<i>flap, r</i>	Right flap
<i>min</i>	Minimum
<i>max</i>	Maximum
<i>c</i>	Continuous

## Acronyms and Abbreviations

MPC	Model Predictive Control
HIL	Hardware-in-the-loop
ETH	Eidgenössische Technische Hochschule
LTI	Linear-time-invariant
LTV	Linear-time-variant