

INPUT SHAPING AND PID CONTROLLER FOR ROTARY CRANE

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LIST OF SYMBOLS

m	Mass of the Payload (kg)
x	Trolley Position (m)
F	Force apply to the trolley (N)
θ	Initial angle of rope (rad)
$\dot{\theta}$	Payload swing angle (rad)
$\ddot{\theta}$	Angular acceleration of the load swing (rad/s ²)
α	Sway angle of the pendulum
$\dot{\alpha}$	Sway angle of the hook
L	Length of the pendulum at load (m)
r	Length of the arm at hook (m)
B	Arm viscous damping
g	Gravity acceleration (m/s ²)
g	Gravity effect
q	State vector
τ	Control vector
ω_n	Natural frequency
ζ	Damping ratio
A	Amplitude of the impulse
t_0	Time location of the impulse
T_r	Rise time
T_s	Settling time
%OS	Percentage Overshoot

LIST OF ABBREVIATIONS

PZS	Positive Zero Sway
PZSD	Positive Zero Sway Derivative
PZSDD	Positive Zero Sway Derivative Derivative
PID	Proportional Integral Derivative
PSD	Power Spectral Density
VI	Virtual Instrument
NI	National Instrument