Right Half Plane Zero

$$G(s) = \frac{1 - 5s}{(s+1)^3)}$$

Set Point Optimization

	Controllers			
Parameters	PID	I-PD	PI-D	PIDA
Controller Transfer Function	$C(s) = \frac{0.8252\ s^2 + 0.9543\ s + 0.3589}{0.04872\ s^2 + 2.64\ s}$	$C_1(s) = \frac{0.1502}{s}$ $C_2(s) = \frac{0.3621\ s + 0.398}{0.01808\ s + 1.0}$	$C_1(s) = 0.3471$ $C_2(s) = \frac{0.1234}{s}$ $C_3(s) = \frac{0.3034\ s}{0.0128\ s + 1.0}$	$C(s) = \frac{0.4214\ s^4 + 1.451\ s^3 + 2.317\ s^2 + 1.63\ s + 0.4415}{0.04242\ s^4 + 0.5689\ s^3 + 2.367\ s^2 + 2.865\ s}$
IAE	7,637903378	9,710111136	8,264793365	6,598731751
K_p	0,358929536	0,398003957	0,347137994	0,441499978
T_i	2,640308828	2,649065642	2,812369788	2,864509727
T_d	0,85228221	0,891769444	0,873894454	0,936622689
T_a				0,611884287
N	46,18846196	49,32124623	68,25409491	1,983096926
α				3,455715048
Phase margin	44.0311	-30.8708 ? Stable = 1	47.5696	38.0803
Gain Margin	1.3763	1.5376	1.4167	1.2328

Disturbance Rejection Optimization

	Controllers	
Parameters	PID	PIDA
Controller Transfer Function	$C(s) = \frac{0.5376\,s^2+0.7939\,s+0.31}{0.02884\,s^2+2.55\,s}$	$C(s) = \frac{0.1559\,s^4+0.9247\,s^3+1.525\,s^2+1.267\,s+0.39}{0.003719\,s^4+0.1124\,s^3+1.055\,s^2+2.884\,s}$
IAE	16,52418459	14,8037091
K_p	0,309964402	0,389991238
T_i	2,549842291	2,883683992
T_d	0,668850105	0,976894256
T_a		0,629224143
N	59,13896184	4,682334801
α		8,003455718
Phase margin	48.5309	46.5306
Gain Margin	1.5733	1.0796