PID

Right Edge Following

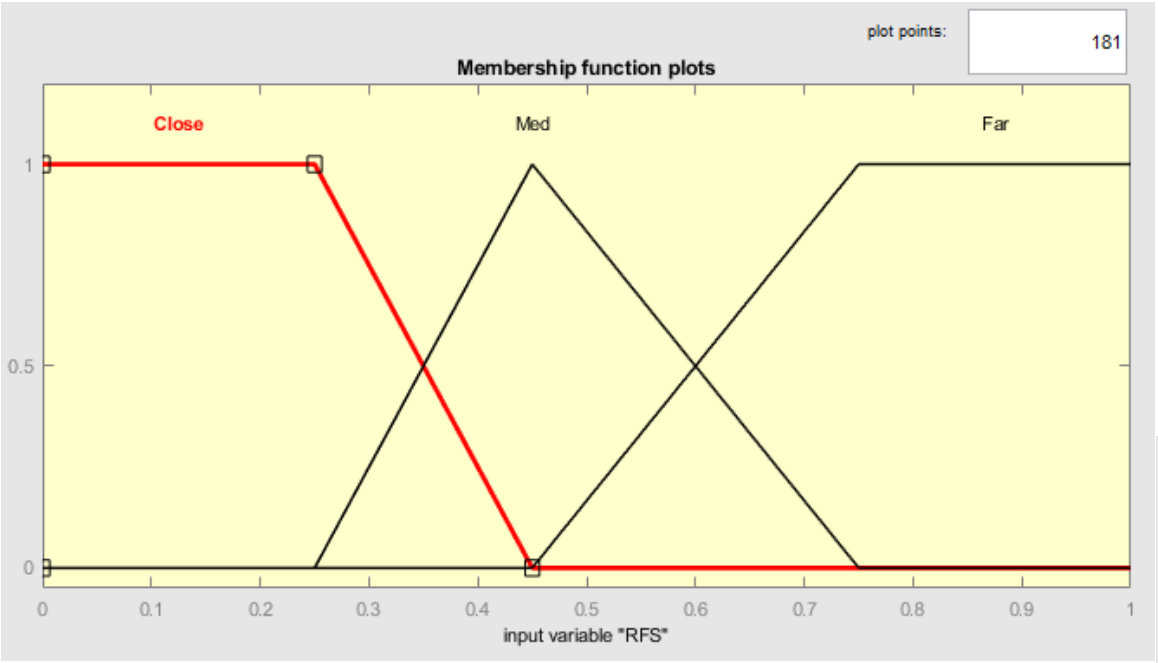
Parameters

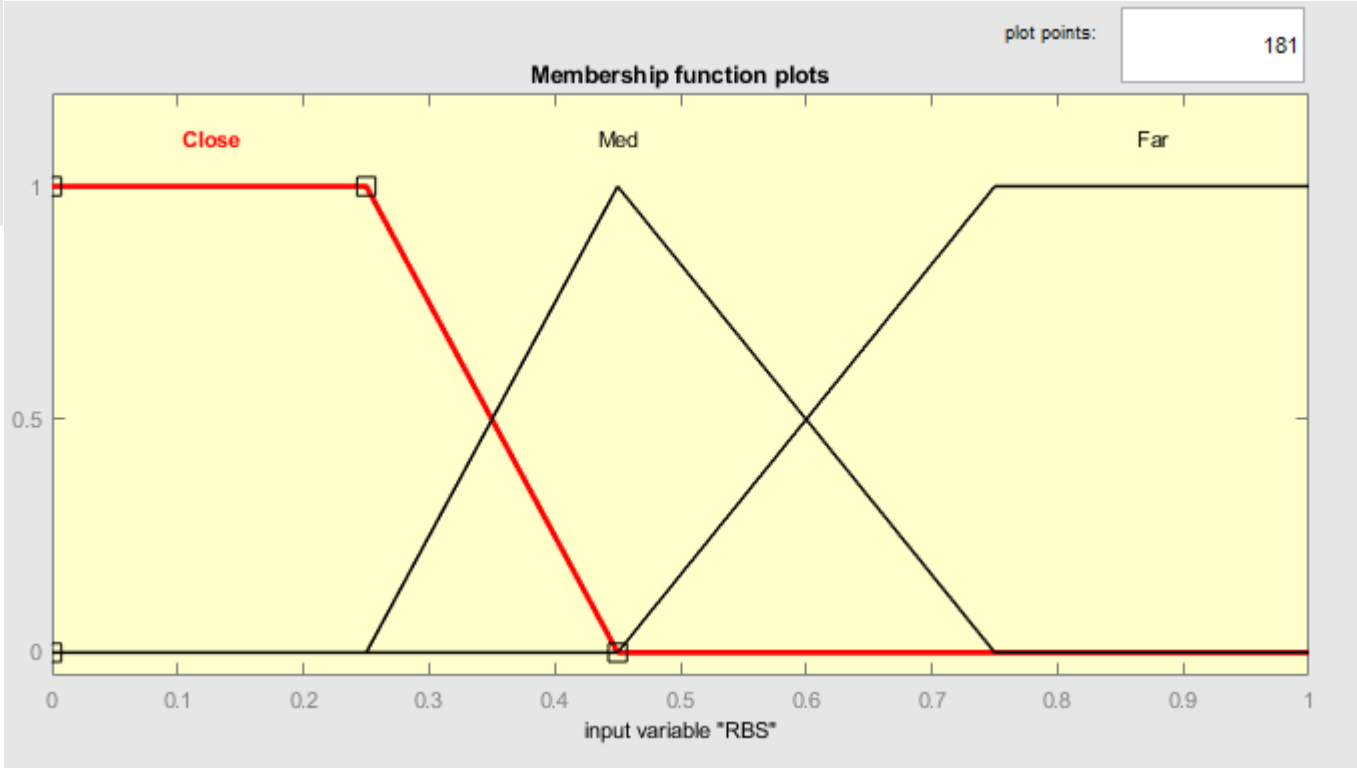
- xLinear = 0.25
- Desired distance = 0.55
- kP = 0.5
- kI = 0.0001
- kD = 0.85

Fuzzy Logic

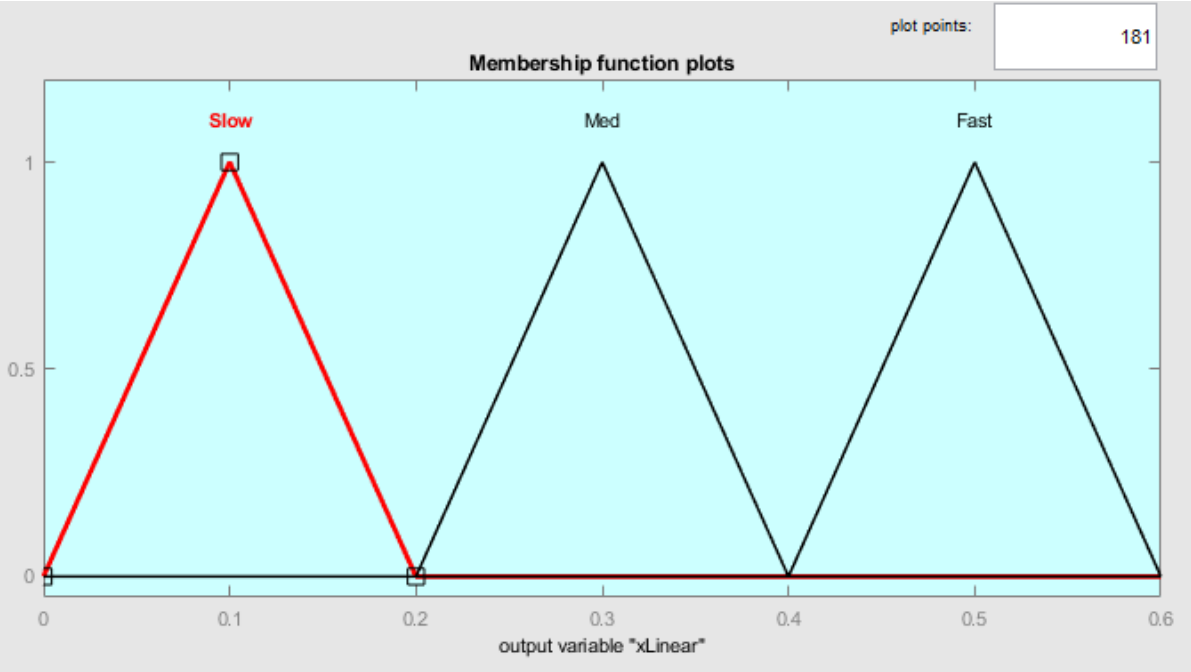
Right Edge Following

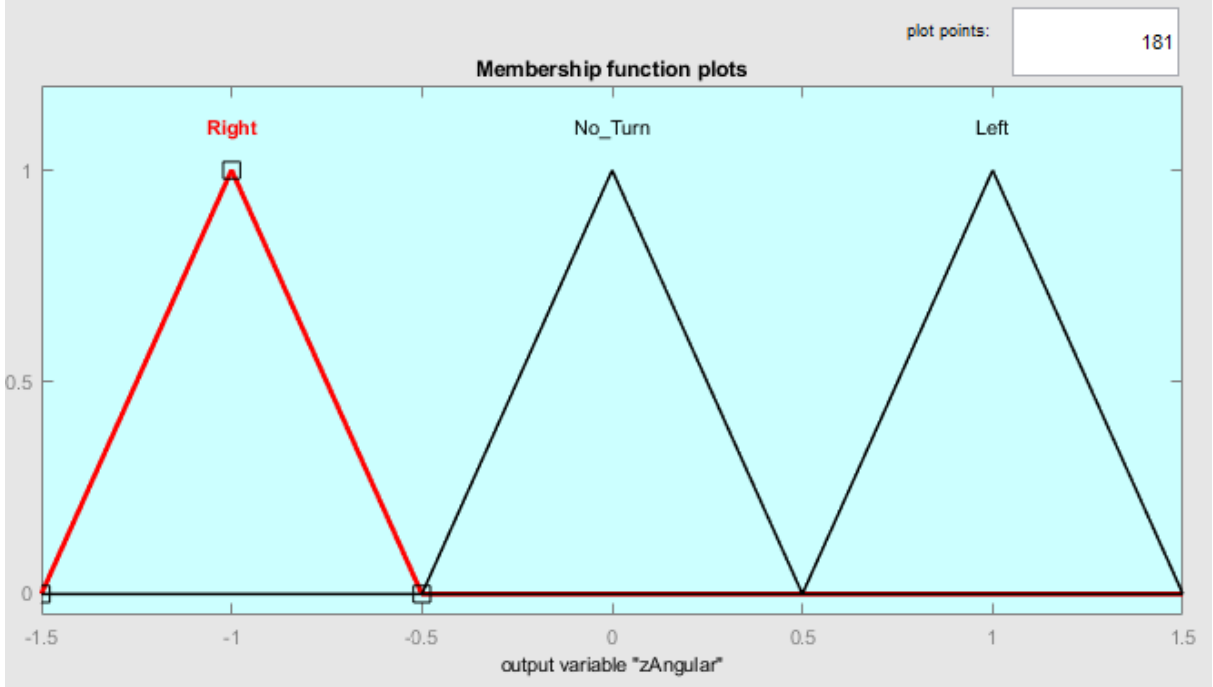
Membership functions





Output figures

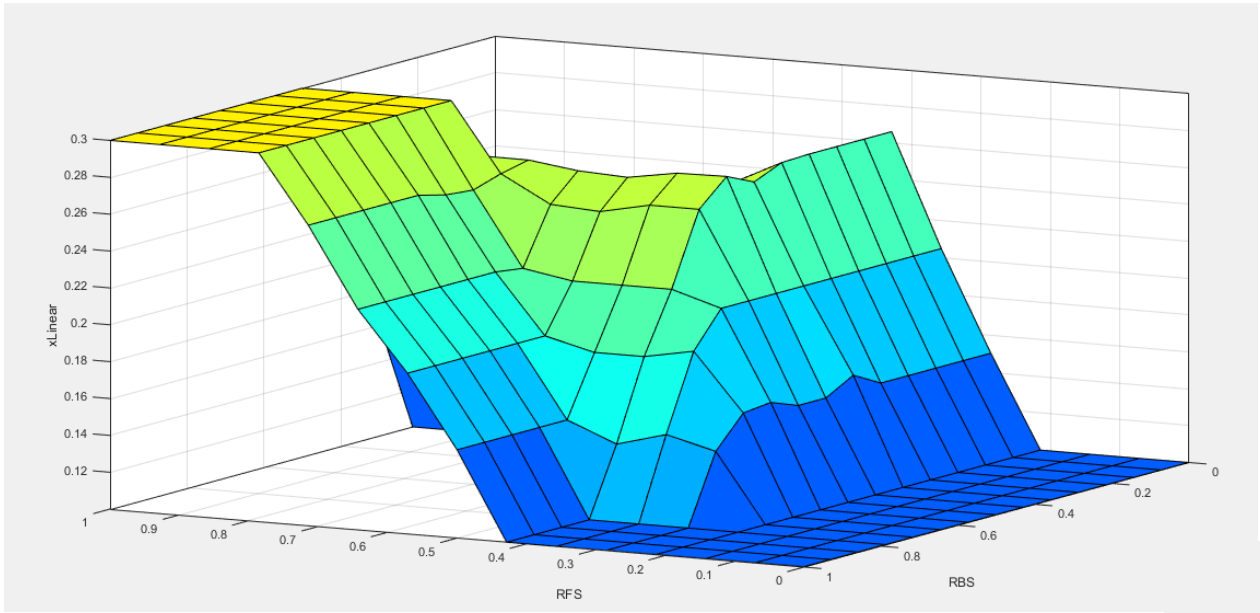


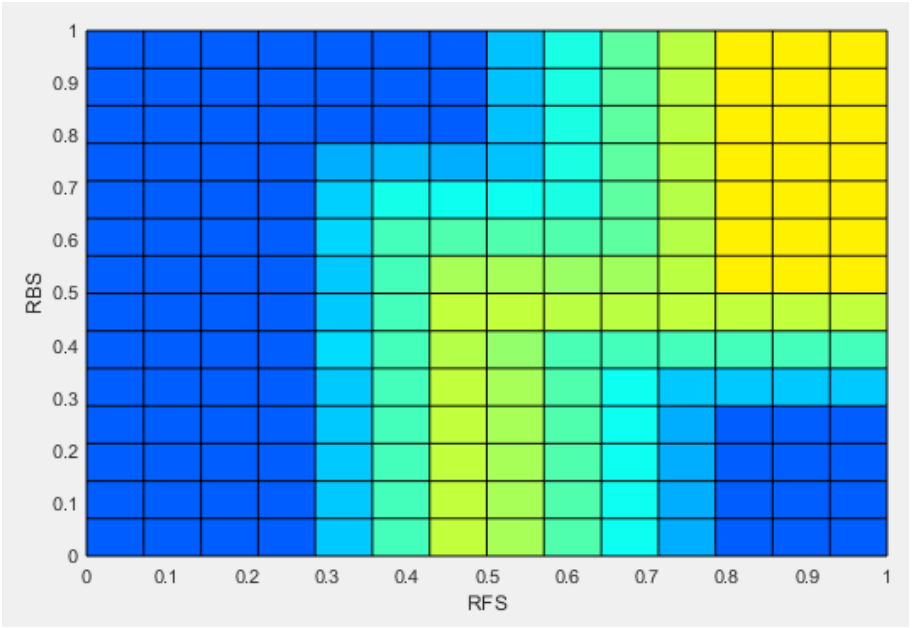


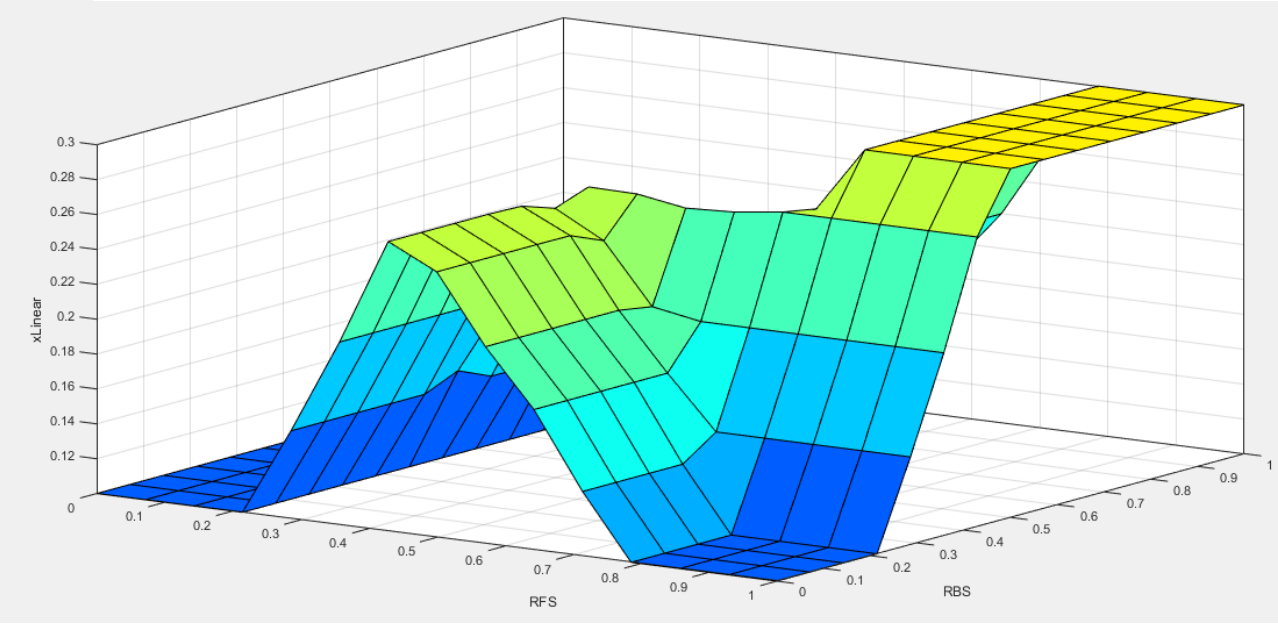
Rule base

RFS	RBS	xLinear	zAngular
Close	Close	Slow	Left
Close	Medium	Slow	Left
Close	Far	Slow	Left
Medium	Close	Medium	Right
Medium	Medium	Medium	No turn
Medium	Far	Slow	Left
Far	Close	Medium	Right
Far	Medium	Medium	Right
Far	Far	Medium	Right

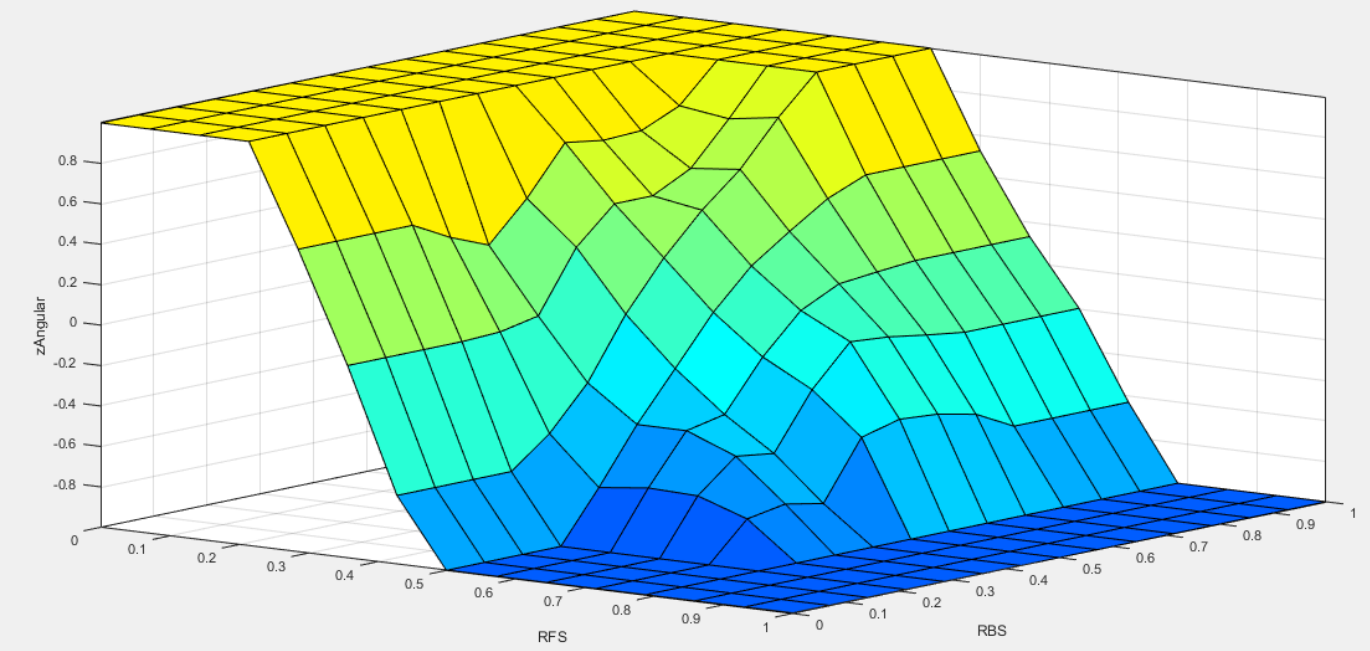
X Linear

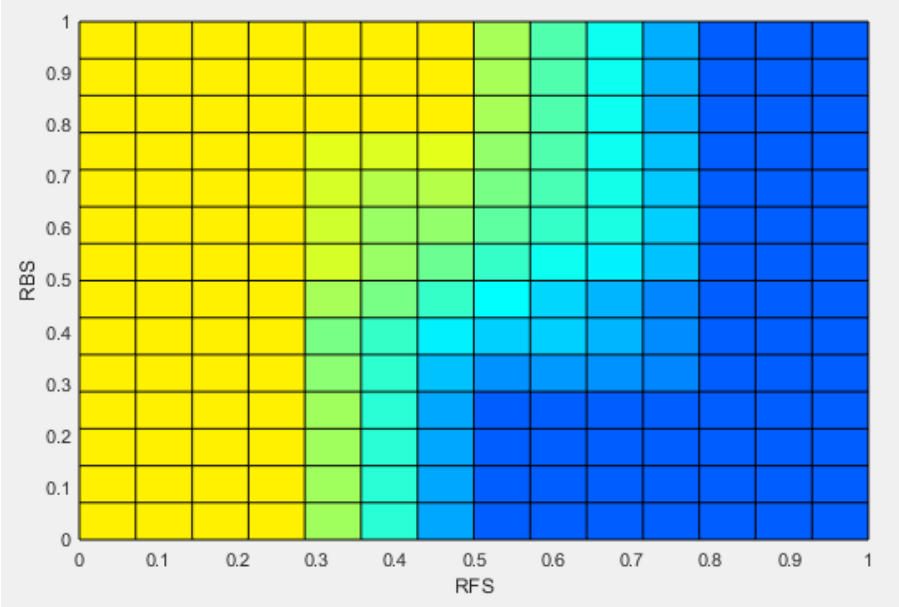


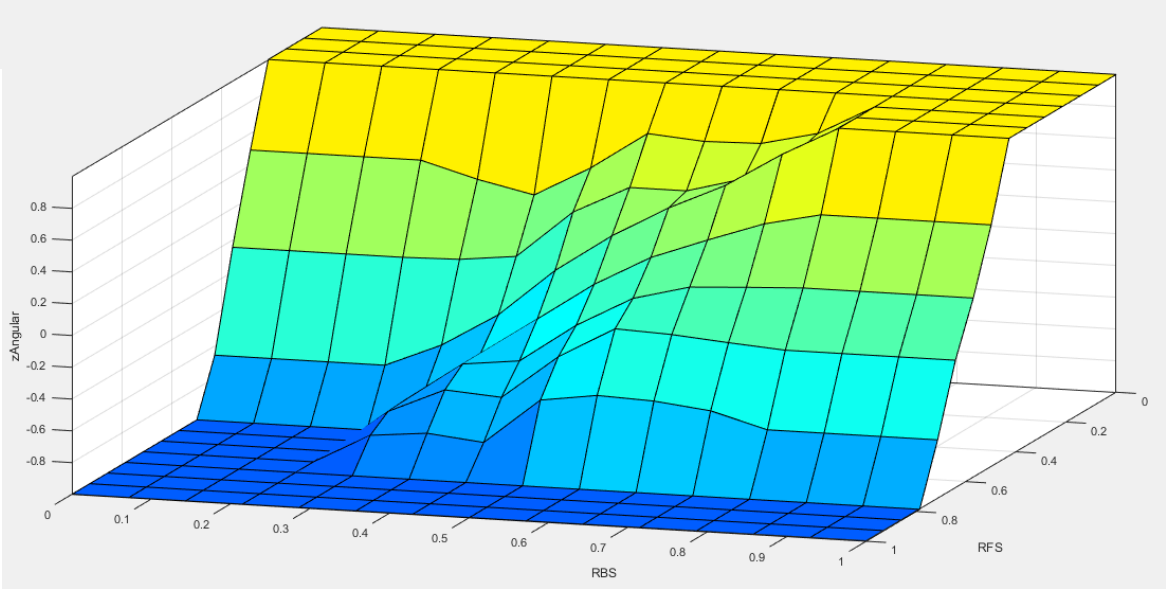




Z Angular







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Fuzzy Logic

Obstacle Avoidance

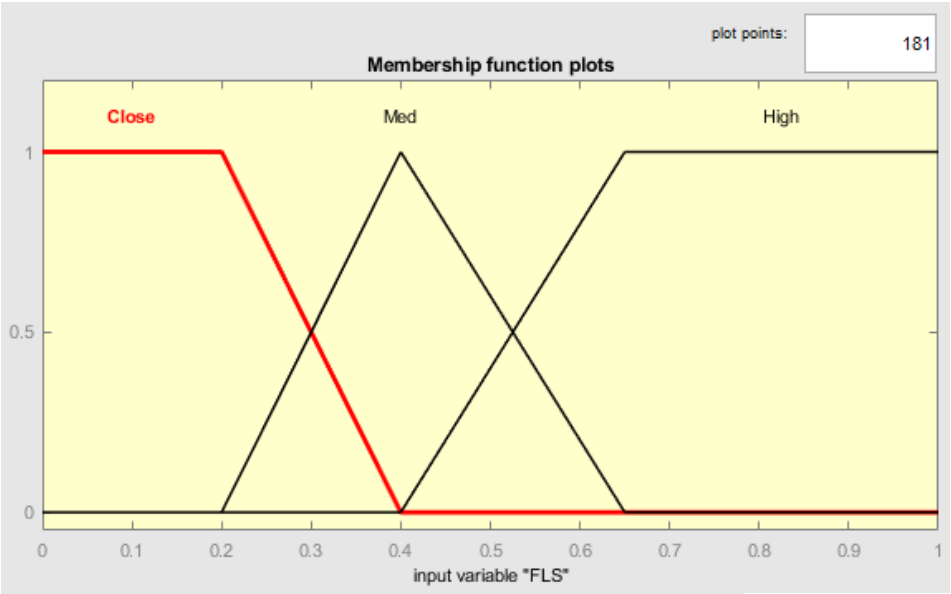
Rule base

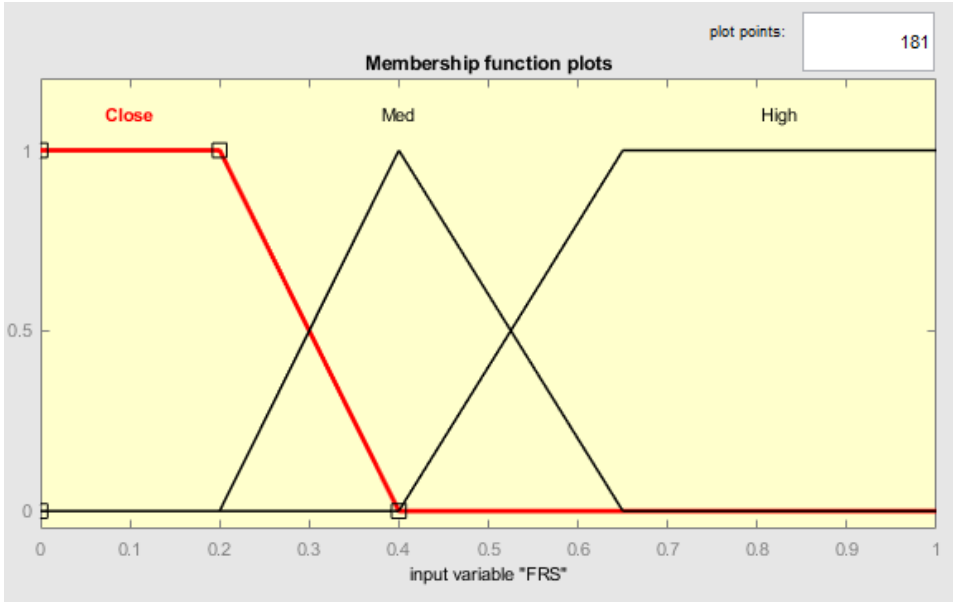
FLS	FMS	FRS	xLinear	zAngular
Close	Close	Close	UltraSlow	No turn
Close	Close	Med	Slow	Right
Close	Close	Far	Slow	Right
Close	Med	Close	UltraSlow	No turn
Close	Med	Med	Slow	Right
Close	Med	Far	Slow	Right
Close	Far	Close	UltraSlow	No turn
Close	Far	Med	Slow	Right
Close	Far	Far	Slow	Right
Med	Close	Close	Slow	Left
Med	Close	Med	Slow	Left
Med	Close	Far	Slow	Right
Med	Med	Close	Slow	Left
Med	Med	Med	Med	No turn

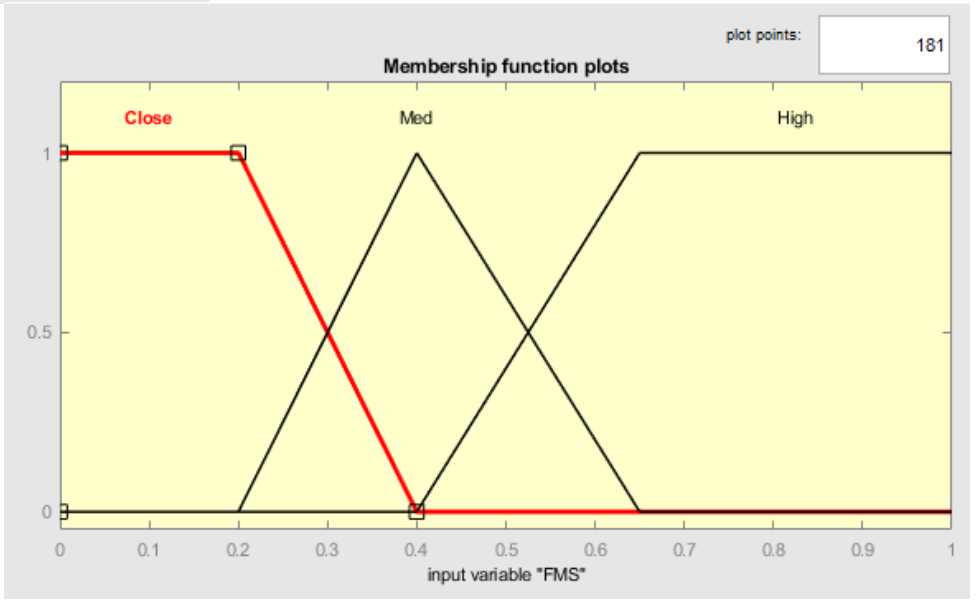
Rule base continue…

FLS	FMS	FRS	xLinear	zAngular
Med	Med	Far	Med	Right
Med	Far	Close	Slow	Left
Med	Far	Med	Med	No turn
Med	Far	Far	Slow	Right
Far	Close	Close	Slow	Left
Far	Close	Med	Slow	Left
Far	Close	Far	Slow	Right
Far	Med	Close	Slow	Left
Far	Med	Med	Slow	Left
Far	Med	Far	Slow	No turn
Far	Far	Close	Slow	Left
Far	Far	Med	Slow	Left
Far	Far	Far	Med	No turn

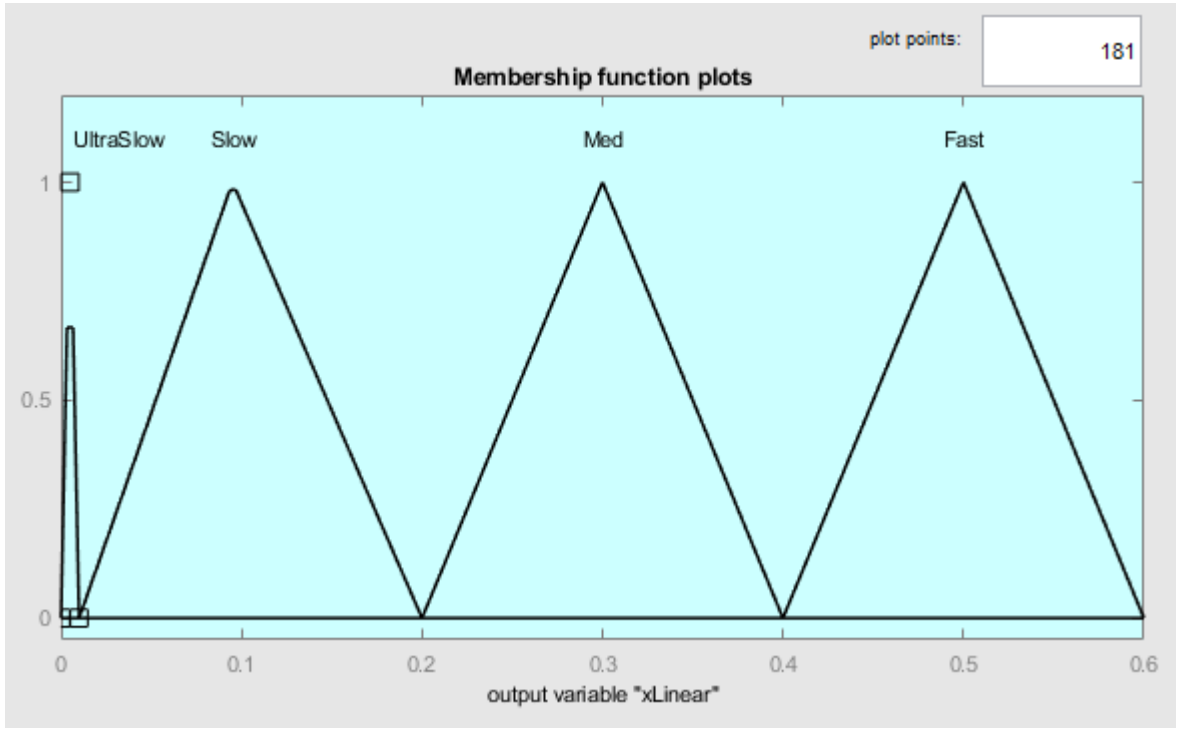
Membership functions

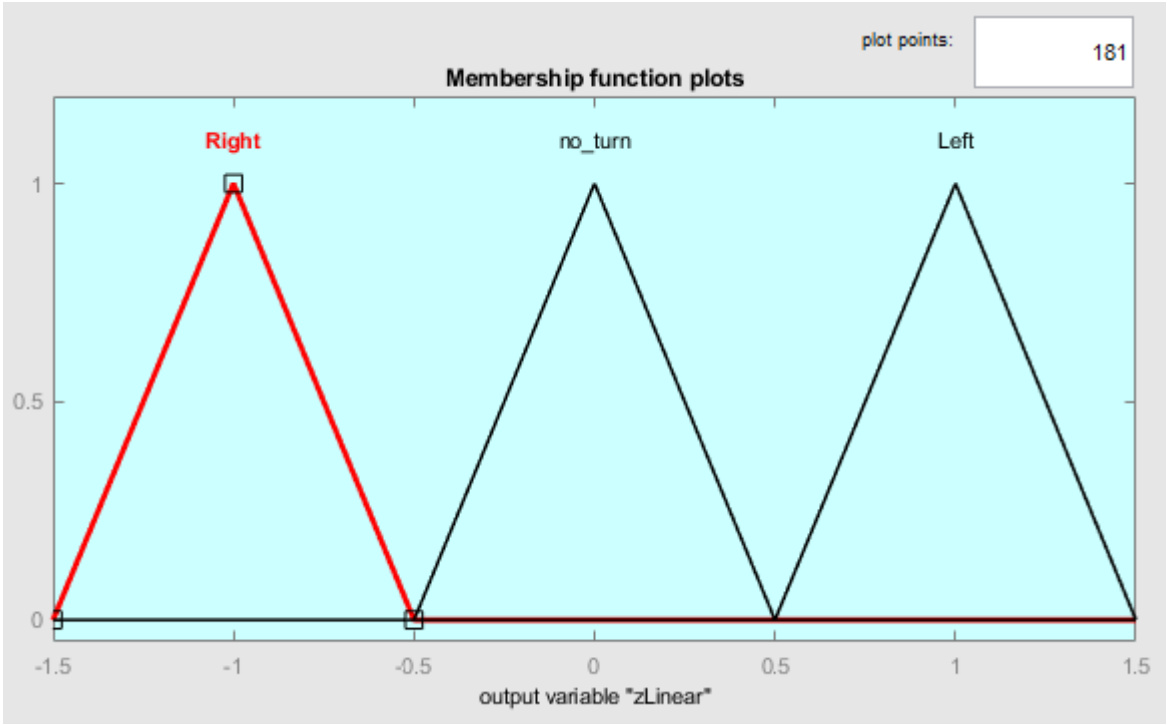






Output figures





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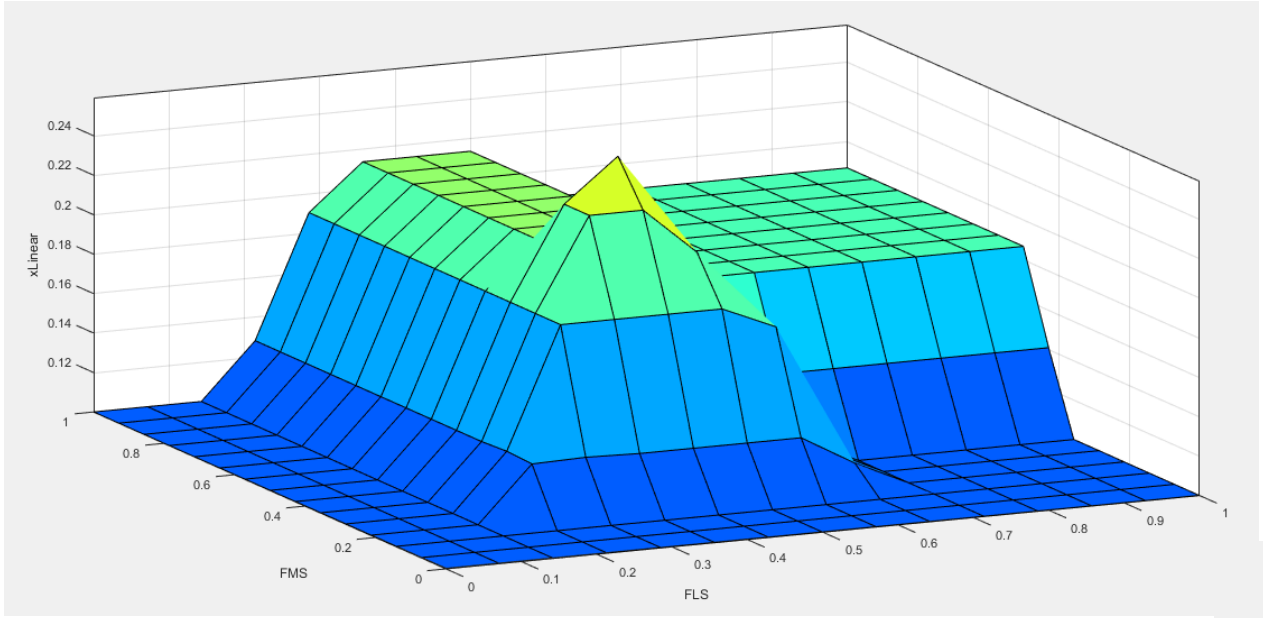
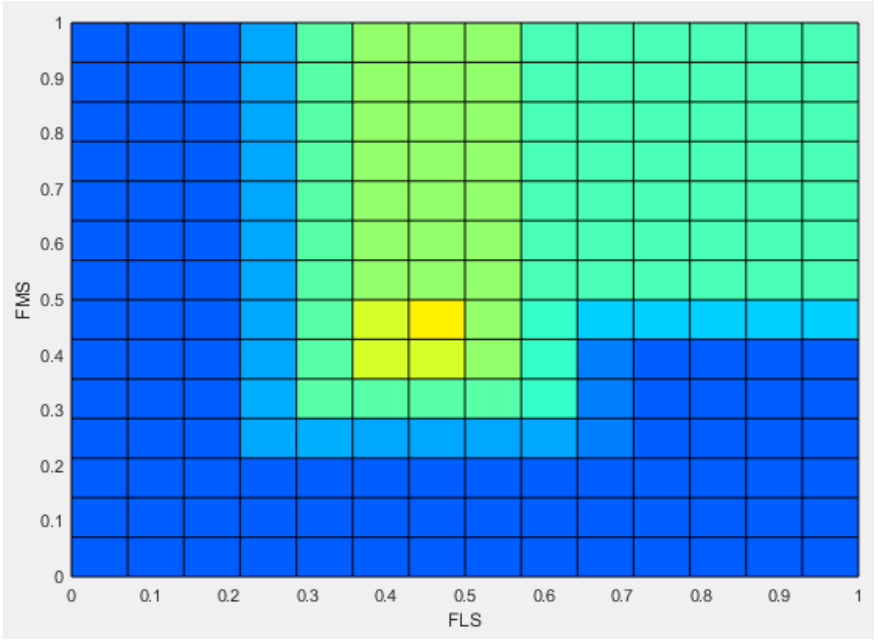
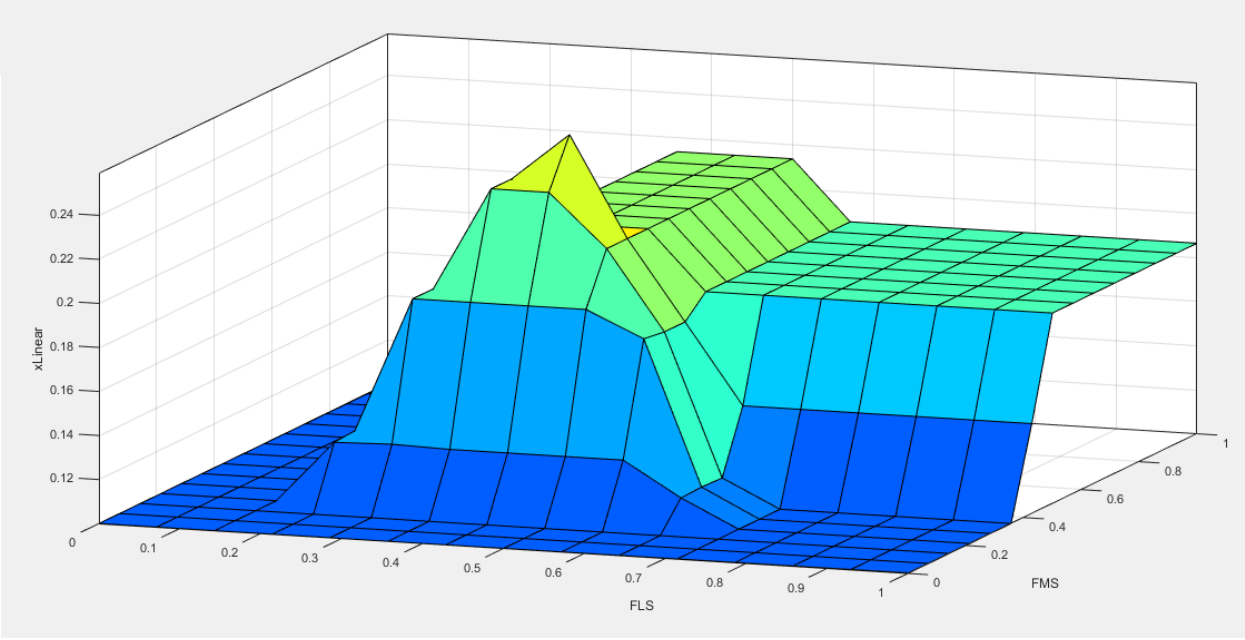
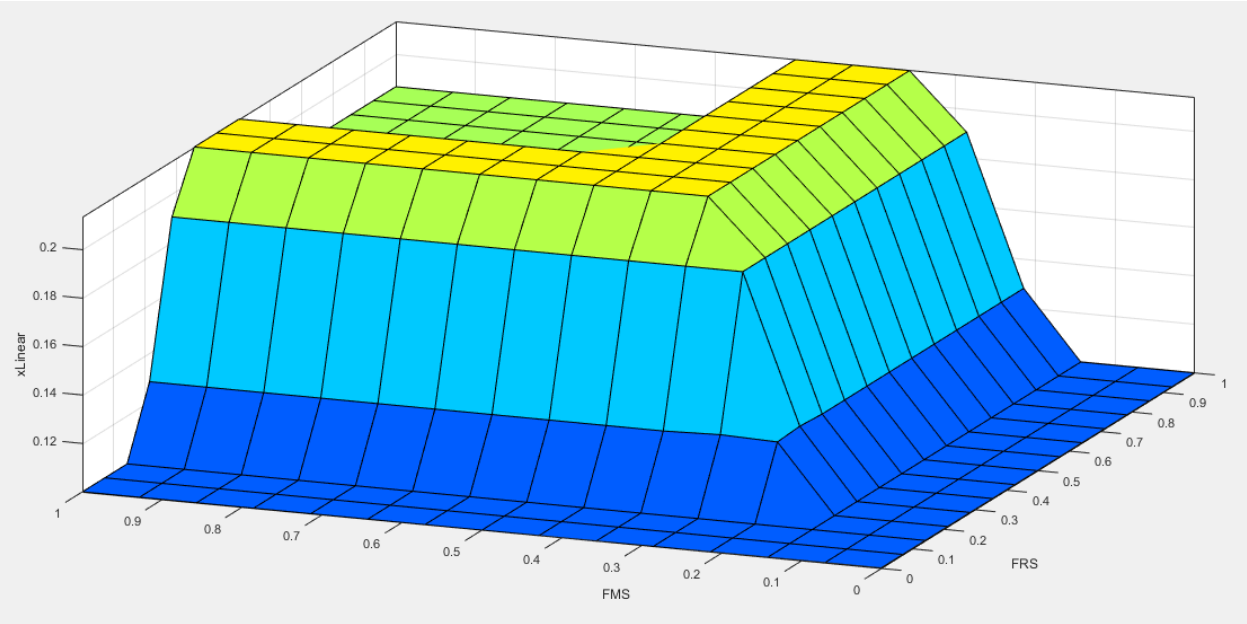
X Linear (FLS & FMS)

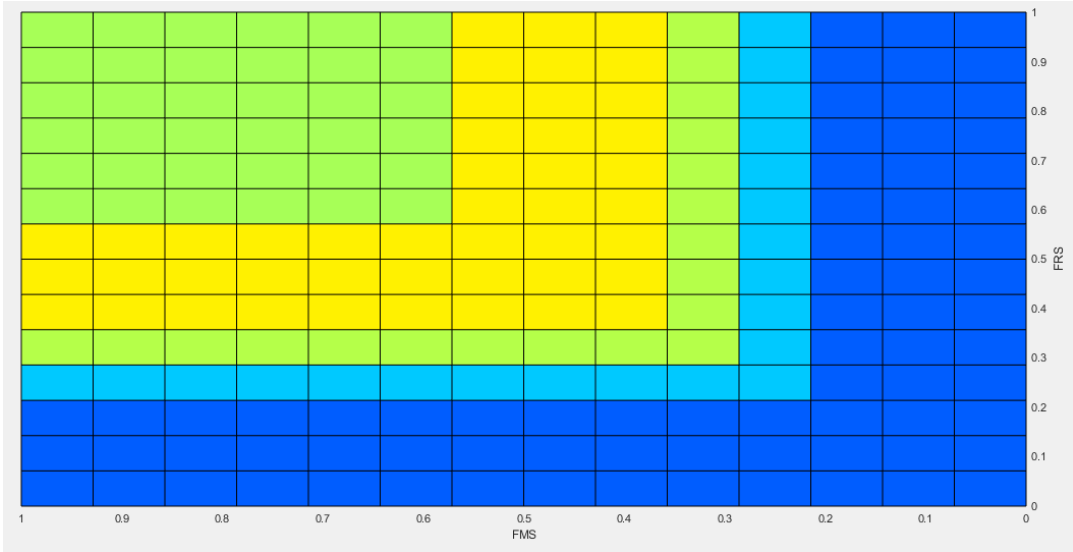


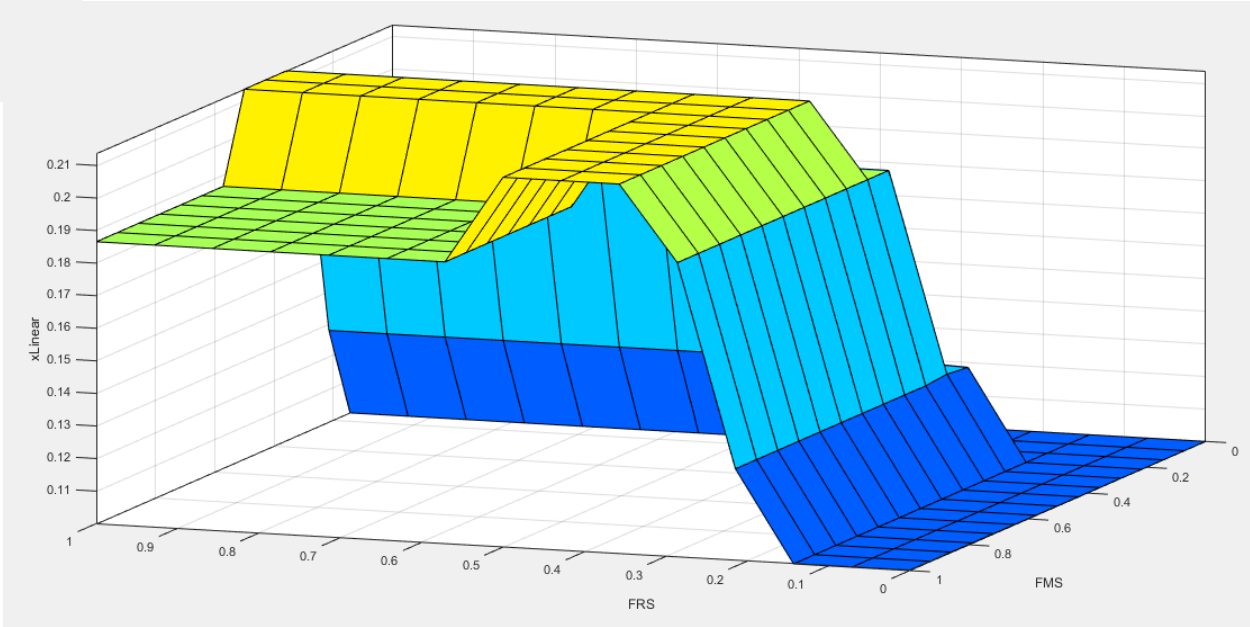




X Linear (FRS & FMS)







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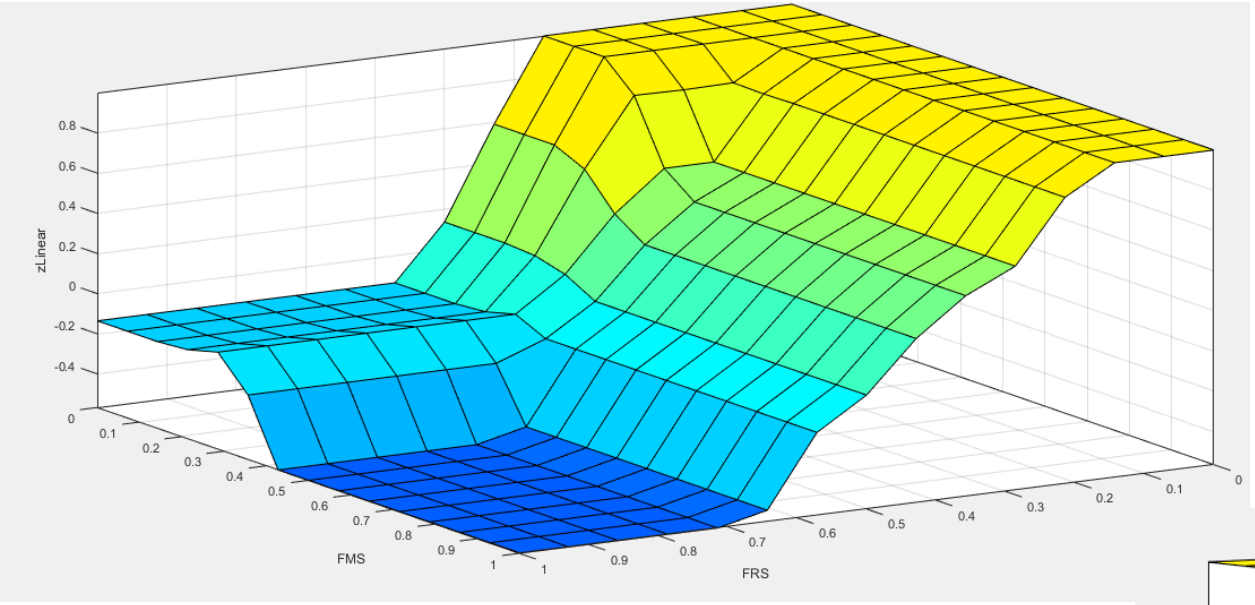
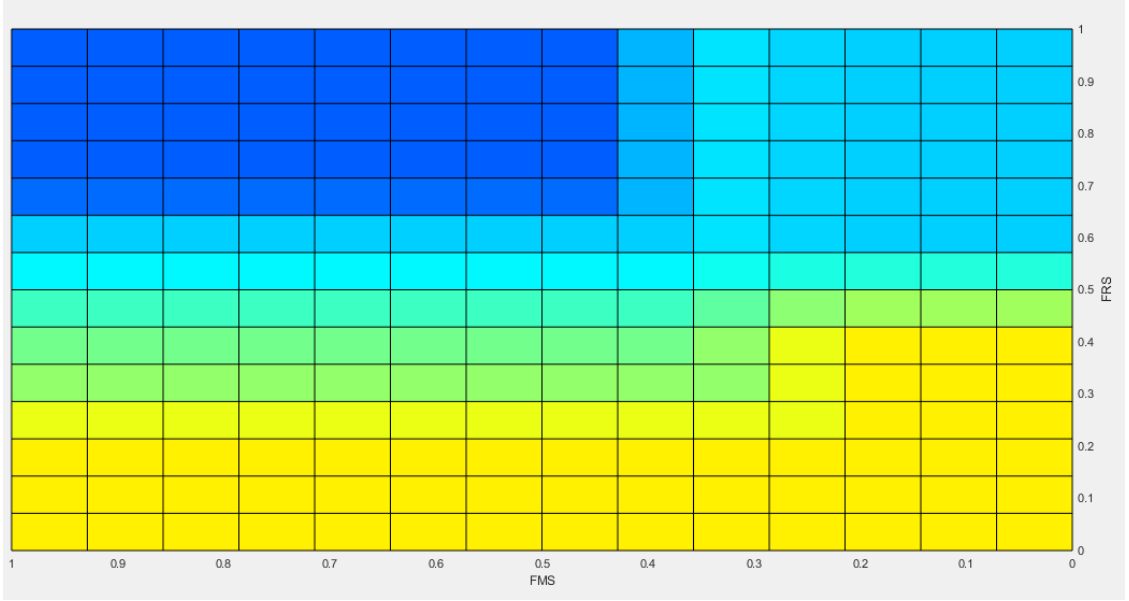
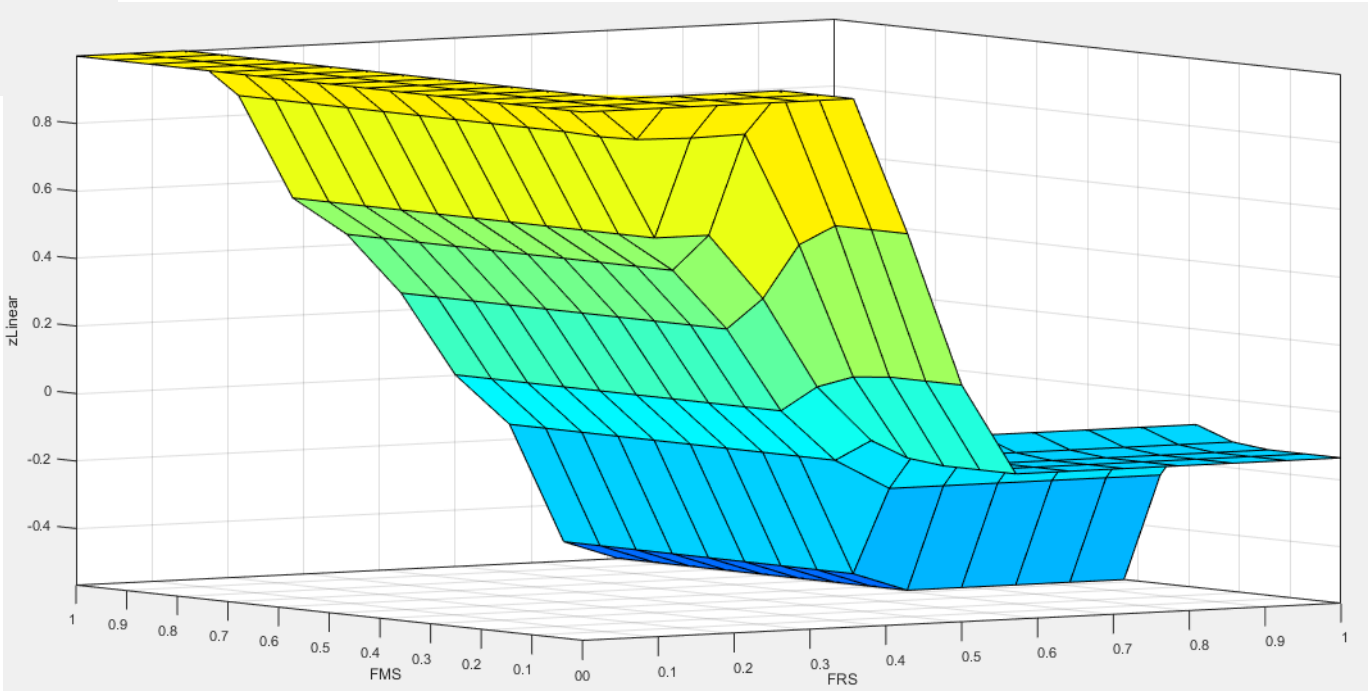
Z Angular (FMS – FRS)







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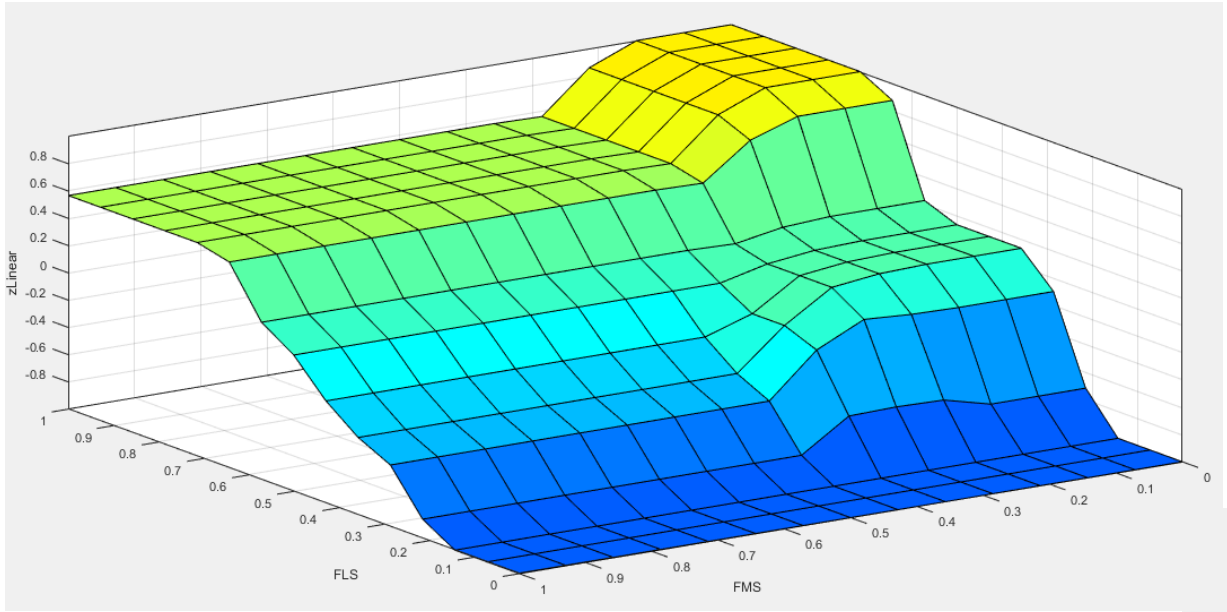
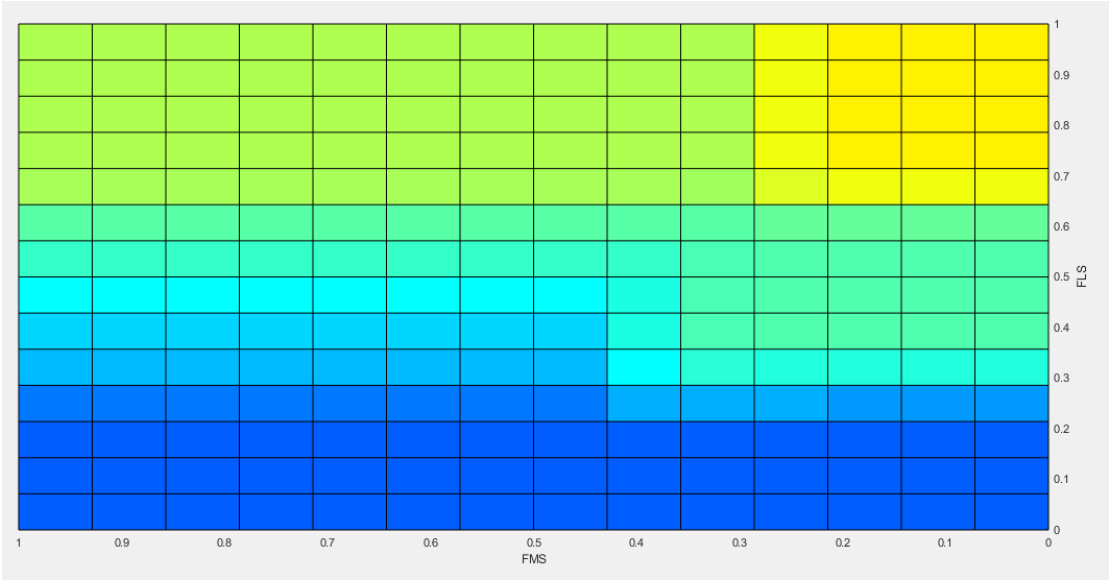
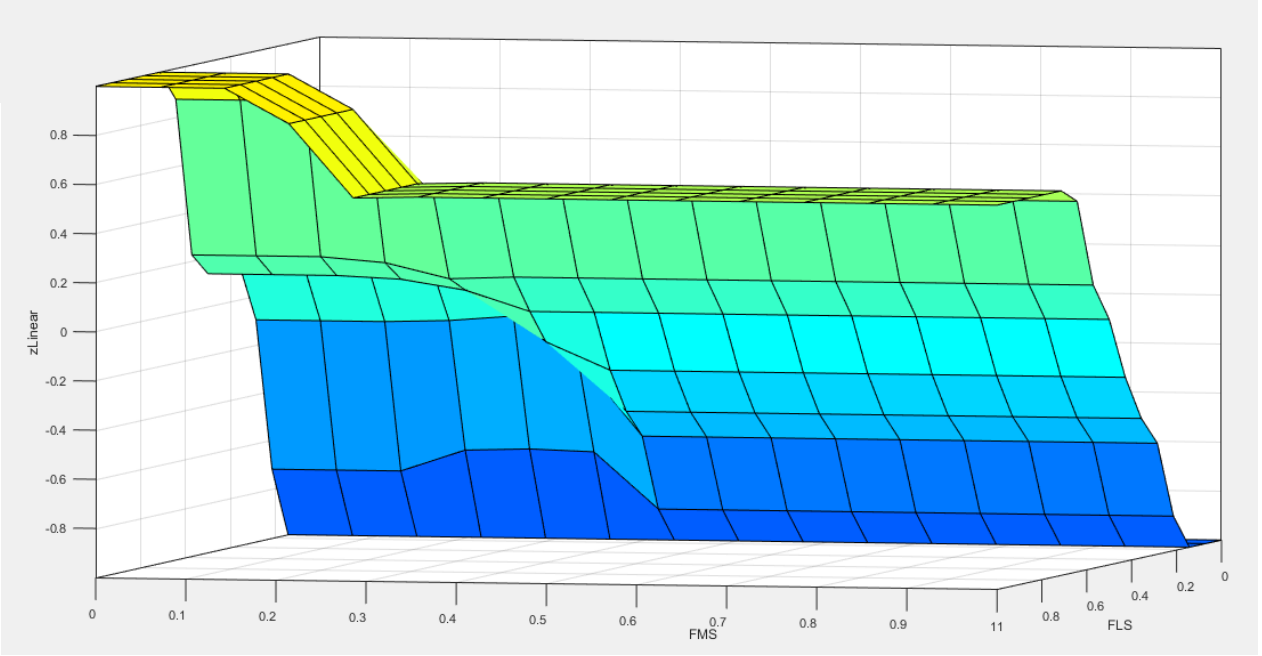
Z Angular (FMS-FLS)







Fuzzy Logic

OA & REF Combined

Membership Function