

## Experimental Results

### Intraoperative data

### Quantitative Analysis

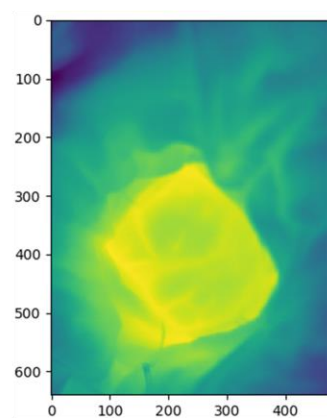
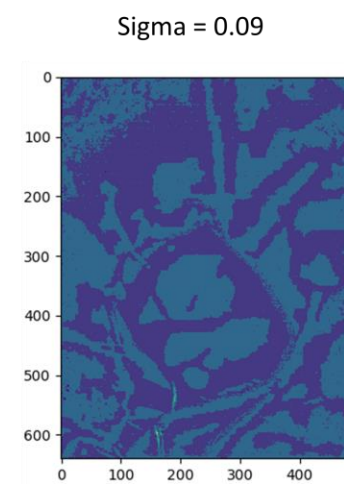
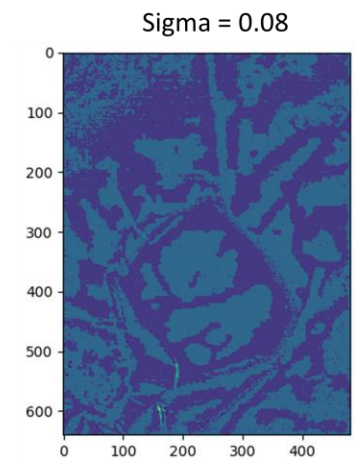
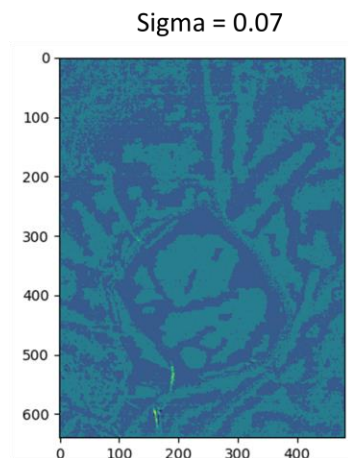
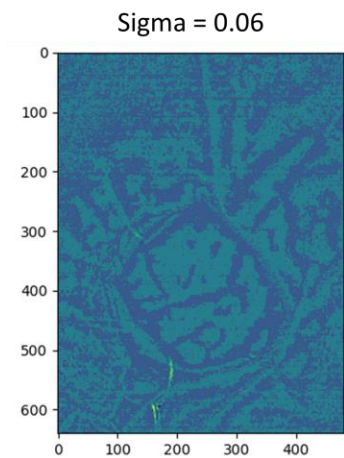
Inference	Unary function	Binary function	# Labels	# knots	offset	Value	Runtime	Bound	MSE (Inference)
TRWS	RMSD	RMSD	10	20	0.06	90609.47639	1083.931728	90609.41422	0.007523742
TRWS	RMSD	RMSD	10	20	0.07	91386.95086	815.2042909	91386.95086	0.007843528
TRWS	RMSD	RMSD	10	20	0.08	92203.79527	1086.85904	92203.78875	0.008208888
TRWS	RMSD	RMSD	10	20	0.09	93062.38118	1291.831003	93062.36153	0.008628597
TRWS	RMSD	RMSD	10	20	0.1	93966.92499	1099.798366	93966.88765	0.009103104
TRWS	RMSD	RMSD	10	20	0.11	94916.33016	1449.026358	94916.33016	0.009626721

Inference	Unary function	Binary function	# Labels	# knots	offset	Value	Runtime	Bound	MSE (Inference)
TRWS	L2 Norm	L2 Norm	10	20	0.01	1056776.573	52.38279104	1056776.568	0.006614937
TRWS	L2 Norm	L2 Norm	10	20	0.06	1117090.193	1188.724967	1117090.067	0.007481578
TRWS	L2 Norm	L2 Norm	10	20	0.07	1138779.492	706.6126451	1138779.492	0.007806554
TRWS	L2 Norm	L2 Norm	10	20	0.08	1162764.554	1199.972347	1162764.554	0.008181554
TRWS	L2 Norm	L2 Norm	10	20	0.09	1188856.79	1283.399976	1188856.79	0.008606554
TRWS	L2 Norm	L2 Norm	10	20	0.1	1216888.806	1134.17853	1216888.806	0.009081554

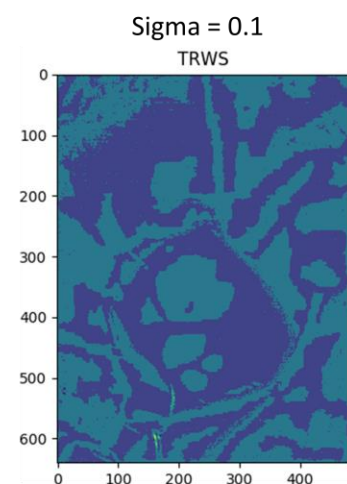
Inference	Unary function	Binary function	# Labels	# knots	offset	Value	Runtime	Bound	MSE (Inference)
TRWS	L1 Norm	L1 Norm	10	20	0.06	21940380.88	205.837049	21940380.88	0.007482937
TRWS	L1 Norm	L1 Norm	10	20	0.07	22532657.84	184.7755029	22532657.84	0.007807798
TRWS	Trunc L2 Norm	Trunc L2 Norm	10	20	0.07	769527.0656	514.2100761	769527.0656	0.007809808
TRWS	Trunc L2 Norm	Trunc L2 Norm	10	20	0.08	788364.9219	1075.914286	788364.9204	0.008184388
TRWS	Trunc L2 Norm	Trunc L2 Norm	10	20	0.09	809452.8971	839.014951	809452.8971	0.008607978
TRWS	Trunc L2 Norm	Trunc L2 Norm	10	20	0.1	832670.5833	658.0224791	832670.5833	0.009082791

## Qualitative Analysis

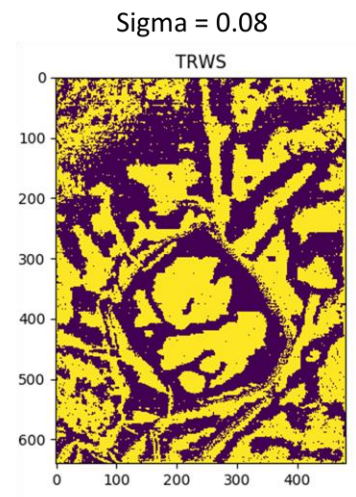
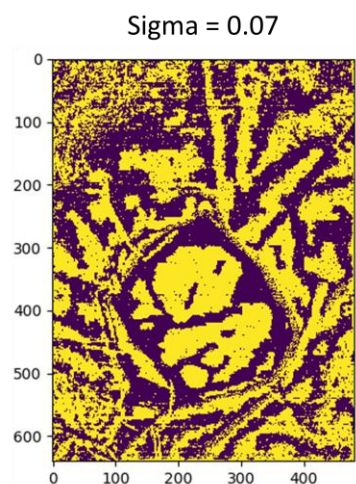
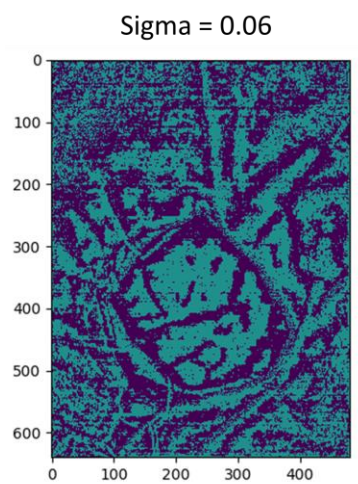
### RMSD (Root Mean Square Distance)



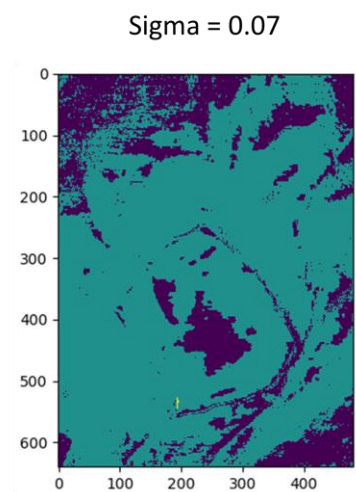
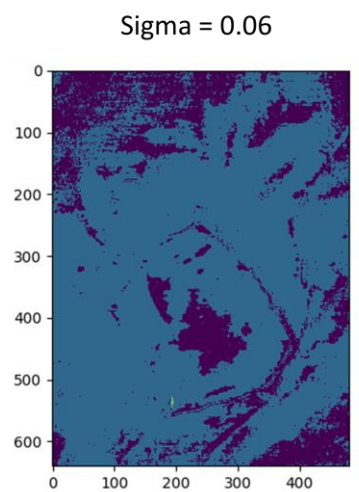
Univariate p-spline



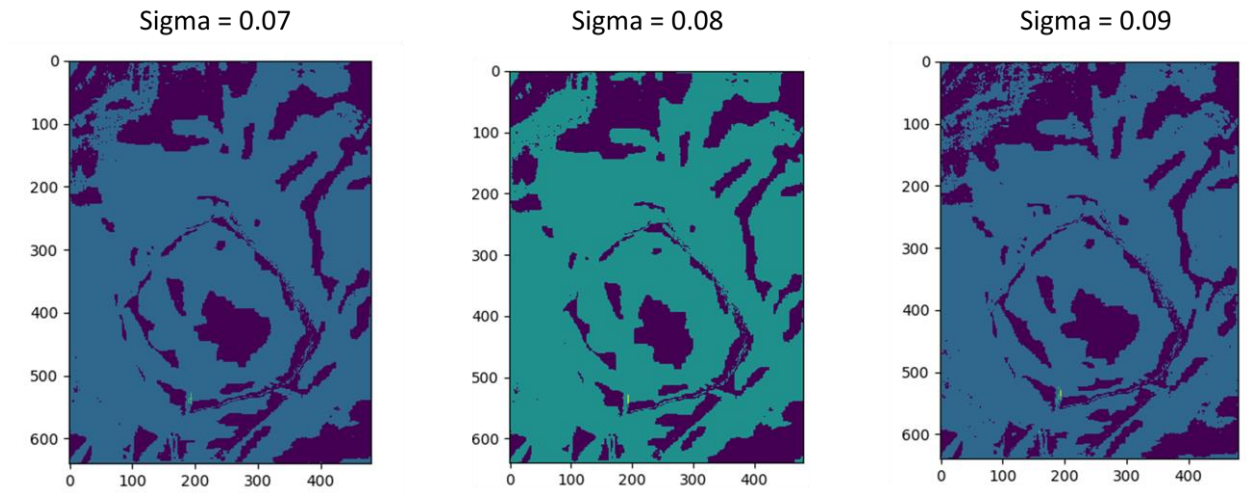
**(L2 Norm)**



**(L1 Norm)**



### (Trunc L2 Norm)



### MSE (Univariate vs Spatial Regularizer)

