

# Cat Swarm Optimization

March 23, 2023 6:46 PM

Without optimization and feature selection

Number of Features: 31

Weighted Average Classification Report are below.

Algorithm	Accuracy	Precision	Recall	F1-Score
Gaussian Naïve Bayes	1.0	1.0	1.0	1.0
Logistic Regression	1.0	1.0	1.0	1.0
K Nearest Neighbor	1.0	1.0	1.0	1.0
Support Vector Classifier	0.68	0.78	0.68	0.56
Decision Trees	1.0	1.0	1.0	1.0

With cat swarm Optimization but with different parameters

max\_iters = 200  
population\_size=10  
Seed = 1234

Number of selected features: 3  
Selected features: radius error, worst texture, worst perimeter  
Subset accuracy: 0.956140350877193  
All Features Accuracy: 0.9122807017543859

Algorithm	Accuracy	Precision	recall	F1-Score
Gaussian Naïve Bayes	0.90	0.90	0.90	0.90
Logistic Regression	0.96	0.96	0.96	0.96
K Nearest Neighbor	0.95	0.95	0.95	0.95
Support Vector Classifier	0.92	0.92	0.92	0.92
Decision Trees	0.88	0.88	0.88	0.88

max\_iters = 200  
population\_size=30  
Seed = 1234

Number of selected features: 4  
Selected features: radius error, worst radius, worst texture, worst perimeter  
Subset accuracy: 0.956140350877193  
All Features Accuracy: 0.9122807017543859

Algorithm	Accuracy	Precision	recall	F1-Score
Gaussian Naïve Bayes	0.91	0.91	0.91	0.91
Logistic Regression	0.95	0.95	0.95	0.95
K Nearest Neighbor	0.93	0.93	0.93	0.93
Support Vector Classifier	0.92	0.92	0.92	0.92
Decision Trees	0.90	0.90	0.90	0.90

max\_iters = 200  
population\_size=50  
Seed = 1234

Number of selected features: 3  
Selected features: worst texture, worst perimeter, worst symmetry  
Subset accuracy: 0.956140350877193  
All Features Accuracy: 0.9122807017543859

Algorithm	Accuracy	Precision	recall	F1-Score
Gaussian Naïve Bayes	0.95	0.95	0.95	0.95
Logistic Regression	0.97	0.97	0.97	0.97
K Nearest Neighbor	0.96	0.97	0.96	0.96
Support Vector Classifier	0.95	0.95	0.95	0.95
Decision Trees	0.95	0.95	0.95	0.95

max\_iters = 500  
population\_size=80  
Seed = 1234

Number of selected features: 4  
Selected features: mean radius, fractal dimension error, worst texture, worst perimeter  
Subset accuracy: 0.956140350877193  
All Features Accuracy: 0.9122807017543859

Algorithm	Accuracy	Precision	recall	F1-Score
Gaussian Naïve Bayes	0.91	0.91	0.91	0.91
Logistic Regression	0.96	0.96	0.96	0.96
K Nearest Neighbor	0.94	0.94	0.94	0.94
Support Vector Classifier	0.91	0.91	0.91	0.91
Decision Trees	0.91	0.91	0.91	0.91