**Results**

**Raw vs DCCA**

Original:

#################### IMAGING + GENETIC: ####################

Best Parameters for untrained data ( linear kernel): {'C': 1}

Accuracy (linear Kernel): 49.43

Balanced Accuracy (linear Kernel): 47.50

F1 (linear Kernel): 49.33

Best Parameters for untrained data ( poly kernel): {'C': 1e-05, 'coef0': 0.0, 'degree': 2, 'gamma': 0.0001}

Accuracy (poly Kernel): 51.34

Balanced Accuracy (poly Kernel): 33.33

F1 (poly Kernel): 34.83

Best Parameters for untrained data ( rbf kernel): {'C': 1e-05, 'gamma': 0.0001}

Accuracy (rbf Kernel): 51.34

Balanced Accuracy (rbf Kernel): 33.33

F1 (rbf Kernel): 34.83

#################### IMAGING + GENETIC DCCA: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.01}

Accuracy (linear Kernel): 47.13

Balanced Accuracy (linear Kernel): 42.04

F1 (linear Kernel): 46.40

Best Parameters for untrained data ( poly kernel): {'C': 1, 'coef0': 0.0, 'degree': 2, 'gamma': 0.001}

Accuracy (poly Kernel): 50.19

Balanced Accuracy (poly Kernel): 33.73

F1 (poly Kernel): 38.16

Best Parameters for untrained data ( rbf kernel): {'C': 1, 'gamma': 0.001}

Accuracy (rbf Kernel): 50.19

Balanced Accuracy (rbf Kernel): 33.73

F1 (rbf Kernel): 38.16

#################### IMAGING: ####################

Best Parameters for untrained data ( linear kernel): {'C': 10}

Accuracy (linear Kernel): 50.19

Balanced Accuracy (linear Kernel): 48.33

F1 (linear Kernel): 49.99

Best Parameters for untrained data ( poly kernel): {'C': 1e-05, 'coef0': 0.0, 'degree': 2, 'gamma': 0.0001}

Accuracy (poly Kernel): 51.34

Balanced Accuracy (poly Kernel): 33.33

F1 (poly Kernel): 34.83

Best Parameters for untrained data ( rbf kernel): {'C': 1e-05, 'gamma': 0.0001}

Accuracy (rbf Kernel): 51.34

Balanced Accuracy (rbf Kernel): 33.33

F1 (rbf Kernel): 34.83

#################### IMAGING DCCA: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.001}

Accuracy (linear Kernel): 51.72

Balanced Accuracy (linear Kernel): 45.82

F1 (linear Kernel): 50.80

Best Parameters for untrained data ( poly kernel): {'C': 1, 'coef0': 0.0, 'degree': 2, 'gamma': 0.01}

Accuracy (poly Kernel): 52.11

Balanced Accuracy (poly Kernel): 40.45

F1 (poly Kernel): 47.76

Best Parameters for untrained data ( rbf kernel): {'C': 1, 'gamma': 0.01}

Accuracy (rbf Kernel): 52.11

Balanced Accuracy (rbf Kernel): 40.45

F1 (rbf Kernel): 47.76

#################### GENETIC: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.01}

Accuracy (linear Kernel): 45.98

Balanced Accuracy (linear Kernel): 34.88

F1 (linear Kernel): 41.28

Best Parameters for untrained data ( poly kernel): {'C': 1e-05, 'coef0': 0.0, 'degree': 2, 'gamma': 0.0001}

Accuracy (poly Kernel): 51.34

Balanced Accuracy (poly Kernel): 33.33

F1 (poly Kernel): 34.83

Best Parameters for untrained data ( rbf kernel): {'C': 1e-05, 'gamma': 0.0001}

Accuracy (rbf Kernel): 51.34

Balanced Accuracy (rbf Kernel): 33.33

F1 (rbf Kernel): 34.83

#################### GENETIC DCCA: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.001}

Accuracy (linear Kernel): 44.44

Balanced Accuracy (linear Kernel): 33.89

F1 (linear Kernel): 40.35

Best Parameters for untrained data ( poly kernel): {'C': 1e-05, 'coef0': 0.0, 'degree': 2, 'gamma': 0.0001}

Accuracy (poly Kernel): 51.34

Balanced Accuracy (poly Kernel): 33.33

F1 (poly Kernel): 34.83

Best Parameters for untrained data ( rbf kernel): {'C': 1e-05, 'gamma': 0.0001}

Accuracy (rbf Kernel): 51.34

Balanced Accuracy (rbf Kernel): 33.33

F1 (rbf Kernel): 34.83

Model with max Accuracy: Imaging Poly with DCCA with an Accuracy score of 52.107

Model with max F1 Score: Imaging Linear with DCCA with an F1 Score of 50.805

Model with max Balanced Accuracy Score: Imaging Linear without DCCA with a Balanced Accuracy Score of 48.327

Scaled and balanced:

#################### IMAGING + GENETIC: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.001}

Accuracy (linear Kernel): 52.74

Balanced Accuracy (linear Kernel): 54.96

F1 (linear Kernel): 49.42

Best Parameters for untrained data ( poly kernel): {'C': 1, 'coef0': 0.0, 'degree': 2, 'gamma': 0.001}

Accuracy (poly Kernel): 52.74

Balanced Accuracy (poly Kernel): 54.78

F1 (poly Kernel): 49.49

Best Parameters for untrained data ( rbf kernel): {'C': 1, 'gamma': 0.001}

Accuracy (rbf Kernel): 52.74

Balanced Accuracy (rbf Kernel): 54.78

F1 (rbf Kernel): 49.49

#################### IMAGING + GENETIC DCCA: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.001}

Accuracy (linear Kernel): 48.63

Balanced Accuracy (linear Kernel): 49.97

F1 (linear Kernel): 47.40

Best Parameters for untrained data ( poly kernel): {'C': 10, 'coef0': 0.0, 'degree': 2, 'gamma': 0.0001}

Accuracy (poly Kernel): 47.95

Balanced Accuracy (poly Kernel): 49.13

F1 (poly Kernel): 47.09

Best Parameters for untrained data ( rbf kernel): {'C': 10, 'gamma': 0.0001}

Accuracy (rbf Kernel): 47.95

Balanced Accuracy (rbf Kernel): 49.13

F1 (rbf Kernel): 47.09

#################### IMAGING: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.001}

Accuracy (linear Kernel): 50.00

Balanced Accuracy (linear Kernel): 51.94

F1 (linear Kernel): 47.80

Best Parameters for untrained data ( poly kernel): {'C': 10, 'coef0': 0.0, 'degree': 2, 'gamma': 0.0001}

Accuracy (poly Kernel): 53.42

Balanced Accuracy (poly Kernel): 55.30

F1 (poly Kernel): 51.12

Best Parameters for untrained data ( rbf kernel): {'C': 10, 'gamma': 0.0001}

Accuracy (rbf Kernel): 53.42

Balanced Accuracy (rbf Kernel): 55.30

F1 (rbf Kernel): 51.12

#################### IMAGING DCCA: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.001}

Accuracy (linear Kernel): 50.00

Balanced Accuracy (linear Kernel): 51.37

F1 (linear Kernel): 49.01

Best Parameters for untrained data ( poly kernel): {'C': 10, 'coef0': 0.0, 'degree': 2, 'gamma': 0.001}

Accuracy (poly Kernel): 48.63

Balanced Accuracy (poly Kernel): 49.60

F1 (poly Kernel): 48.08

Best Parameters for untrained data ( rbf kernel): {'C': 10, 'gamma': 0.001}

Accuracy (rbf Kernel): 48.63

Balanced Accuracy (rbf Kernel): 49.60

F1 (rbf Kernel): 48.08

#################### GENETIC: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.01}

Accuracy (linear Kernel): 41.10

Balanced Accuracy (linear Kernel): 42.66

F1 (linear Kernel): 38.78

Best Parameters for untrained data ( poly kernel): {'C': 1, 'coef0': 0.0, 'degree': 2, 'gamma': 0.01}

Accuracy (poly Kernel): 41.78

Balanced Accuracy (poly Kernel): 42.90

F1 (poly Kernel): 40.71

Best Parameters for untrained data ( rbf kernel): {'C': 1, 'gamma': 0.01}

Accuracy (rbf Kernel): 41.78

Balanced Accuracy (rbf Kernel): 42.90

F1 (rbf Kernel): 40.71

#################### GENETIC DCCA: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.001}

Accuracy (linear Kernel): 37.67

Balanced Accuracy (linear Kernel): 38.60

F1 (linear Kernel): 36.73

Best Parameters for untrained data ( poly kernel): {'C': 10, 'coef0': 0.0, 'degree': 2, 'gamma': 0.001}

Accuracy (poly Kernel): 36.30

Balanced Accuracy (poly Kernel): 37.41

F1 (poly Kernel): 35.12

Best Parameters for untrained data ( rbf kernel): {'C': 10, 'gamma': 0.001}

Accuracy (rbf Kernel): 36.30

Balanced Accuracy (rbf Kernel): 37.41

F1 (rbf Kernel): 35.12

Model with max Accuracy: Imaging Poly without DCCA with an Accuracy score of 53.425

Model with max F1 Score: Imaging Poly without DCCA with an F1 Score of 51.125

Model with max Balanced Accuracy Score: Imaging Poly without DCCA with a Balanced Accuracy Score of 55.296

**MCA vs MCA-DCCA**

Original:

#################### IMAGING + GENETIC: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.1}

Accuracy (linear Kernel): 50.19

Balanced Accuracy (linear Kernel): 48.33

F1 (linear Kernel): 49.99

Best Parameters for untrained data ( poly kernel): {'C': 1e-05, 'coef0': 0.0, 'degree': 2, 'gamma': 0.0001}

Accuracy (poly Kernel): 51.34

Balanced Accuracy (poly Kernel): 33.33

F1 (poly Kernel): 34.83

Best Parameters for untrained data ( rbf kernel): {'C': 1e-05, 'gamma': 0.0001}

Accuracy (rbf Kernel): 51.34

Balanced Accuracy (rbf Kernel): 33.33

F1 (rbf Kernel): 34.83

#################### IMAGING + GENETIC DCCA: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.001}

Accuracy (linear Kernel): 46.36

Balanced Accuracy (linear Kernel): 46.90

F1 (linear Kernel): 46.75

Best Parameters for untrained data ( poly kernel): {'C': 1, 'coef0': 0.0, 'degree': 2, 'gamma': 0.001}

Accuracy (poly Kernel): 50.96

Balanced Accuracy (poly Kernel): 33.57

F1 (poly Kernel): 36.52

Best Parameters for untrained data ( rbf kernel): {'C': 1, 'gamma': 0.001}

Accuracy (rbf Kernel): 50.96

Balanced Accuracy (rbf Kernel): 33.57

F1 (rbf Kernel): 36.52

#################### IMAGING: ####################

Best Parameters for untrained data ( linear kernel): {'C': 1}

Accuracy (linear Kernel): 50.57

Balanced Accuracy (linear Kernel): 48.74

F1 (linear Kernel): 50.34

Best Parameters for untrained data ( poly kernel): {'C': 1e-05, 'coef0': 0.0, 'degree': 2, 'gamma': 0.0001}

Accuracy (poly Kernel): 51.34

Balanced Accuracy (poly Kernel): 33.33

F1 (poly Kernel): 34.83

Best Parameters for untrained data ( rbf kernel): {'C': 1e-05, 'gamma': 0.0001}

Accuracy (rbf Kernel): 51.34

Balanced Accuracy (rbf Kernel): 33.33

F1 (rbf Kernel): 34.83

#################### IMAGING DCCA: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.01}

Accuracy (linear Kernel): 42.91

Balanced Accuracy (linear Kernel): 37.47

F1 (linear Kernel): 41.70

Best Parameters for untrained data ( poly kernel): {'C': 1, 'coef0': 0.0, 'degree': 2, 'gamma': 0.01}

Accuracy (poly Kernel): 47.89

Balanced Accuracy (poly Kernel): 34.63

F1 (poly Kernel): 40.13

Best Parameters for untrained data ( rbf kernel): {'C': 1, 'gamma': 0.01}

Accuracy (rbf Kernel): 47.89

Balanced Accuracy (rbf Kernel): 34.63

F1 (rbf Kernel): 40.13

#################### GENETIC: ####################

Best Parameters for untrained data ( linear kernel): {'C': 1}

Accuracy (linear Kernel): 49.04

Balanced Accuracy (linear Kernel): 32.17

F1 (linear Kernel): 35.19

Best Parameters for untrained data ( poly kernel): {'C': 1e-05, 'coef0': 0.0, 'degree': 2, 'gamma': 0.0001}

Accuracy (poly Kernel): 51.34

Balanced Accuracy (poly Kernel): 33.33

F1 (poly Kernel): 34.83

Best Parameters for untrained data ( rbf kernel): {'C': 1e-05, 'gamma': 0.0001}

Accuracy (rbf Kernel): 51.34

Balanced Accuracy (rbf Kernel): 33.33

F1 (rbf Kernel): 34.83

#################### GENETIC DCCA: ####################

Best Parameters for untrained data ( linear kernel): {'C': 1}

Accuracy (linear Kernel): 39.08

Balanced Accuracy (linear Kernel): 34.05

F1 (linear Kernel): 39.39

Best Parameters for untrained data ( poly kernel): {'C': 1e-05, 'coef0': 0.0, 'degree': 2, 'gamma': 0.0001}

Accuracy (poly Kernel): 51.34

Balanced Accuracy (poly Kernel): 33.33

F1 (poly Kernel): 34.83

Best Parameters for untrained data ( rbf kernel): {'C': 1e-05, 'gamma': 0.0001}

Accuracy (rbf Kernel): 51.34

Balanced Accuracy (rbf Kernel): 33.33

F1 (rbf Kernel): 34.83

Model with max Accuracy: Both Poly without DCCA with an Accuracy score of 51.341

Model with max F1 Score: Imaging Linear without DCCA with an F1 Score of 50.344

Model with max Balanced Accuracy Score: Imaging Linear without DCCA with a Balanced Accuracy Score of 48.739

Scaled and balanced:

#################### IMAGING + GENETIC: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.0001}

Accuracy (linear Kernel): 57.53

Balanced Accuracy (linear Kernel): 57.24

F1 (linear Kernel): 52.60

Best Parameters for untrained data ( poly kernel): {'C': 1, 'coef0': 0.0, 'degree': 2, 'gamma': 0.001}

Accuracy (poly Kernel): 59.59

Balanced Accuracy (poly Kernel): 59.41

F1 (poly Kernel): 57.85

Best Parameters for untrained data ( rbf kernel): {'C': 1, 'gamma': 0.001}

Accuracy (rbf Kernel): 59.59

Balanced Accuracy (rbf Kernel): 59.41

F1 (rbf Kernel): 57.85

#################### IMAGING + GENETIC DCCA: ####################

Best Parameters for untrained data ( linear kernel): {'C': 1}

Accuracy (linear Kernel): 35.62

Balanced Accuracy (linear Kernel): 36.02

F1 (linear Kernel): 35.25

Best Parameters for untrained data ( poly kernel): {'C': 10, 'coef0': 0.0, 'degree': 2, 'gamma': 0.0001}

Accuracy (poly Kernel): 38.36

Balanced Accuracy (poly Kernel): 39.07

F1 (poly Kernel): 37.94

Best Parameters for untrained data ( rbf kernel): {'C': 10, 'gamma': 0.0001}

Accuracy (rbf Kernel): 38.36

Balanced Accuracy (rbf Kernel): 39.07

F1 (rbf Kernel): 37.94

#################### IMAGING: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.0001}

Accuracy (linear Kernel): 57.53

Balanced Accuracy (linear Kernel): 57.24

F1 (linear Kernel): 52.60

Best Parameters for untrained data ( poly kernel): {'C': 1, 'coef0': 0.0, 'degree': 2, 'gamma': 0.001}

Accuracy (poly Kernel): 59.59

Balanced Accuracy (poly Kernel): 59.41

F1 (poly Kernel): 57.85

Best Parameters for untrained data ( rbf kernel): {'C': 1, 'gamma': 0.001}

Accuracy (rbf Kernel): 59.59

Balanced Accuracy (rbf Kernel): 59.41

F1 (rbf Kernel): 57.85

#################### IMAGING DCCA: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.001}

Accuracy (linear Kernel): 43.15

Balanced Accuracy (linear Kernel): 46.05

F1 (linear Kernel): 34.43

Best Parameters for untrained data ( poly kernel): {'C': 10, 'coef0': 0.0, 'degree': 2, 'gamma': 0.0001}

Accuracy (poly Kernel): 40.41

Balanced Accuracy (poly Kernel): 43.02

F1 (poly Kernel): 32.92

Best Parameters for untrained data ( rbf kernel): {'C': 10, 'gamma': 0.0001}

Accuracy (rbf Kernel): 40.41

Balanced Accuracy (rbf Kernel): 43.02

F1 (rbf Kernel): 32.92

#################### GENETIC: ####################

Best Parameters for untrained data ( linear kernel): {'C': 1}

Accuracy (linear Kernel): 37.67

Balanced Accuracy (linear Kernel): 37.64

F1 (linear Kernel): 37.27

Best Parameters for untrained data ( poly kernel): {'C': 10, 'coef0': 0.0, 'degree': 2, 'gamma': 1}

Accuracy (poly Kernel): 37.67

Balanced Accuracy (poly Kernel): 37.70

F1 (poly Kernel): 36.75

Best Parameters for untrained data ( rbf kernel): {'C': 10, 'gamma': 1}

Accuracy (rbf Kernel): 37.67

Balanced Accuracy (rbf Kernel): 37.70

F1 (rbf Kernel): 36.75

#################### GENETIC DCCA: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.1}

Accuracy (linear Kernel): 34.93

Balanced Accuracy (linear Kernel): 35.25

F1 (linear Kernel): 34.85

Best Parameters for untrained data ( poly kernel): {'C': 0.0001, 'coef0': 0.0, 'degree': 2, 'gamma': 0.1}

Accuracy (poly Kernel): 30.82

Balanced Accuracy (poly Kernel): 33.33

F1 (poly Kernel): 14.52

Best Parameters for untrained data ( rbf kernel): {'C': 0.001, 'gamma': 0.1}

Accuracy (rbf Kernel): 30.82

Balanced Accuracy (rbf Kernel): 33.33

F1 (rbf Kernel): 14.52

Model with max Accuracy: Both Poly without DCCA with an Accuracy score of 59.589

Model with max F1 Score: Both Poly without DCCA with an F1 Score of 57.847

Model with max Balanced Accuracy Score: Both Poly without DCCA with a Balanced Accuracy Score of 59.41

**OPNMF vs OPNMF DCCA**

Original:

#################### IMAGING + GENETIC: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.001}

Accuracy (linear Kernel): 51.74

Balanced Accuracy (linear Kernel): 48.64

F1 (linear Kernel): 51.51

Best Parameters for untrained data ( poly kernel): {'C': 1e-05, 'coef0': 0.0, 'degree': 2, 'gamma': 0.0001}

Accuracy (poly Kernel): 51.35

Balanced Accuracy (poly Kernel): 33.33

F1 (poly Kernel): 34.85

Best Parameters for untrained data ( rbf kernel): {'C': 1e-05, 'gamma': 0.0001}

Accuracy (rbf Kernel): 51.35

Balanced Accuracy (rbf Kernel): 33.33

F1 (rbf Kernel): 34.85

#################### IMAGING + GENETIC DCCA: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.01}

Accuracy (linear Kernel): 45.95

Balanced Accuracy (linear Kernel): 44.50

F1 (linear Kernel): 46.08

Best Parameters for untrained data ( poly kernel): {'C': 10, 'coef0': 0.0, 'degree': 2, 'gamma': 0.0001}

Accuracy (poly Kernel): 47.88

Balanced Accuracy (poly Kernel): 43.08

F1 (poly Kernel): 47.25

Best Parameters for untrained data ( rbf kernel): {'C': 10, 'gamma': 0.0001}

Accuracy (rbf Kernel): 47.88

Balanced Accuracy (rbf Kernel): 43.08

F1 (rbf Kernel): 47.25

#################### IMAGING: ####################

Best Parameters for untrained data ( linear kernel): {'C': 1e-05}

Accuracy (linear Kernel): 53.28

Balanced Accuracy (linear Kernel): 50.26

F1 (linear Kernel): 53.16

Best Parameters for untrained data ( poly kernel): {'C': 1e-05, 'coef0': 0.0, 'degree': 2, 'gamma': 0.0001}

Accuracy (poly Kernel): 51.35

Balanced Accuracy (poly Kernel): 33.33

F1 (poly Kernel): 34.85

Best Parameters for untrained data ( rbf kernel): {'C': 1e-05, 'gamma': 0.0001}

Accuracy (rbf Kernel): 51.35

Balanced Accuracy (rbf Kernel): 33.33

F1 (rbf Kernel): 34.85

#################### IMAGING DCCA: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.001}

Accuracy (linear Kernel): 48.65

Balanced Accuracy (linear Kernel): 47.06

F1 (linear Kernel): 48.78

Best Parameters for untrained data ( poly kernel): {'C': 10, 'coef0': 0.0, 'degree': 2, 'gamma': 0.0001}

Accuracy (poly Kernel): 49.42

Balanced Accuracy (poly Kernel): 43.25

F1 (poly Kernel): 48.36

Best Parameters for untrained data ( rbf kernel): {'C': 10, 'gamma': 0.0001}

Accuracy (rbf Kernel): 49.42

Balanced Accuracy (rbf Kernel): 43.25

F1 (rbf Kernel): 48.36

#################### GENETIC: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.01}

Accuracy (linear Kernel): 45.95

Balanced Accuracy (linear Kernel): 34.95

F1 (linear Kernel): 41.26

Best Parameters for untrained data ( poly kernel): {'C': 1e-05, 'coef0': 0.0, 'degree': 2, 'gamma': 0.0001}

Accuracy (poly Kernel): 51.35

Balanced Accuracy (poly Kernel): 33.33

F1 (poly Kernel): 34.85

Best Parameters for untrained data ( rbf kernel): {'C': 1e-05, 'gamma': 0.0001}

Accuracy (rbf Kernel): 51.35

Balanced Accuracy (rbf Kernel): 33.33

F1 (rbf Kernel): 34.85

#################### GENETIC DCCA: ####################

Best Parameters for untrained data ( linear kernel): {'C': 1}

Accuracy (linear Kernel): 45.95

Balanced Accuracy (linear Kernel): 38.60

F1 (linear Kernel): 44.72

Best Parameters for untrained data ( poly kernel): {'C': 10, 'coef0': 0.0, 'degree': 2, 'gamma': 0.001}

Accuracy (poly Kernel): 45.56

Balanced Accuracy (poly Kernel): 37.57

F1 (poly Kernel): 43.87

Best Parameters for untrained data ( rbf kernel): {'C': 10, 'gamma': 0.001}

Accuracy (rbf Kernel): 45.56

Balanced Accuracy (rbf Kernel): 37.57

F1 (rbf Kernel): 43.87

Model with max Accuracy: Imaging Linear without DCCA with an Accuracy score of 53.282

Model with max F1 Score: Imaging Linear without DCCA with an F1 Score of 53.158

Model with max Balanced Accuracy Score: Imaging Linear without DCCA with a Balanced Accuracy Score of 50.258

Scaled and balanced:

#################### IMAGING + GENETIC: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.001}

Accuracy (linear Kernel): 48.28

Balanced Accuracy (linear Kernel): 52.55

F1 (linear Kernel): 44.16

Best Parameters for untrained data ( poly kernel): {'C': 1e-05, 'coef0': 0.0, 'degree': 2, 'gamma': 0.001}

Accuracy (poly Kernel): 28.97

Balanced Accuracy (poly Kernel): 33.33

F1 (poly Kernel): 13.01

Best Parameters for untrained data ( rbf kernel): {'C': 1e-05, 'gamma': 0.001}

Accuracy (rbf Kernel): 28.97

Balanced Accuracy (rbf Kernel): 33.33

F1 (rbf Kernel): 13.01

#################### IMAGING + GENETIC DCCA: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.001}

Accuracy (linear Kernel): 49.66

Balanced Accuracy (linear Kernel): 51.40

F1 (linear Kernel): 46.52

Best Parameters for untrained data ( poly kernel): {'C': 10, 'coef0': 0.0, 'degree': 2, 'gamma': 0.0001}

Accuracy (poly Kernel): 49.66

Balanced Accuracy (poly Kernel): 50.95

F1 (poly Kernel): 49.03

Best Parameters for untrained data ( rbf kernel): {'C': 10, 'gamma': 0.0001}

Accuracy (rbf Kernel): 49.66

Balanced Accuracy (rbf Kernel): 50.95

F1 (rbf Kernel): 49.03

#################### IMAGING: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.0001}

Accuracy (linear Kernel): 51.03

Balanced Accuracy (linear Kernel): 54.79

F1 (linear Kernel): 48.08

Best Parameters for untrained data ( poly kernel): {'C': 1e-05, 'coef0': 0.0, 'degree': 2, 'gamma': 0.001}

Accuracy (poly Kernel): 28.97

Balanced Accuracy (poly Kernel): 33.33

F1 (poly Kernel): 13.01

Best Parameters for untrained data ( rbf kernel): {'C': 1e-05, 'gamma': 0.001}

Accuracy (rbf Kernel): 28.97

Balanced Accuracy (rbf Kernel): 33.33

F1 (rbf Kernel): 13.01

#################### IMAGING DCCA: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.0001}

Accuracy (linear Kernel): 49.66

Balanced Accuracy (linear Kernel): 51.45

F1 (linear Kernel): 45.55

Best Parameters for untrained data ( poly kernel): {'C': 1, 'coef0': 0.0, 'degree': 2, 'gamma': 0.001}

Accuracy (poly Kernel): 49.66

Balanced Accuracy (poly Kernel): 50.95

F1 (poly Kernel): 48.54

Best Parameters for untrained data ( rbf kernel): {'C': 1, 'gamma': 0.001}

Accuracy (rbf Kernel): 49.66

Balanced Accuracy (rbf Kernel): 50.95

F1 (rbf Kernel): 48.54

#################### GENETIC: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.001}

Accuracy (linear Kernel): 37.93

Balanced Accuracy (linear Kernel): 42.73

F1 (linear Kernel): 30.37

Best Parameters for untrained data ( poly kernel): {'C': 1, 'coef0': 0.0, 'degree': 2, 'gamma': 0.01}

Accuracy (poly Kernel): 41.38

Balanced Accuracy (poly Kernel): 46.28

F1 (poly Kernel): 34.09

Best Parameters for untrained data ( rbf kernel): {'C': 1, 'gamma': 0.01}

Accuracy (rbf Kernel): 41.38

Balanced Accuracy (rbf Kernel): 46.28

F1 (rbf Kernel): 34.09

#################### GENETIC DCCA: ####################

Best Parameters for untrained data ( linear kernel): {'C': 0.01}

Accuracy (linear Kernel): 40.69

Balanced Accuracy (linear Kernel): 41.20

F1 (linear Kernel): 40.69

Best Parameters for untrained data ( poly kernel): {'C': 10, 'coef0': 0.0, 'degree': 2, 'gamma': 0.001}

Accuracy (poly Kernel): 40.69

Balanced Accuracy (poly Kernel): 40.97

F1 (poly Kernel): 40.70

Best Parameters for untrained data ( rbf kernel): {'C': 10, 'gamma': 0.001}

Accuracy (rbf Kernel): 40.69

Balanced Accuracy (rbf Kernel): 40.97

F1 (rbf Kernel): 40.70

Model with max Accuracy: Imaging Linear without DCCA with an Accuracy score of 51.034

Model with max F1 Score: Both Poly with DCCA with an F1 Score of 49.031

Model with max Balanced Accuracy Score: Imaging Linear without DCCA with a Balanced Accuracy Score of 54.788

**FAMD**

Original:

Best Parameters for untrained data ( linear kernel): {'C': 0.01}

Accuracy (linear Kernel): 54.41

Balanced Accuracy (linear Kernel): 45.82

F1 (linear Kernel): 52.05

Best Parameters for untrained data ( poly kernel): {'C': 10, 'coef0': 0.0, 'degree': 2, 'gamma': 0.01}

Accuracy (poly Kernel): 55.17

Balanced Accuracy (poly Kernel): 44.42

F1 (poly Kernel): 50.87

Best Parameters for untrained data ( rbf kernel): {'C': 10, 'gamma': 0.01}

Accuracy (rbf Kernel): 55.17

Balanced Accuracy (rbf Kernel): 44.42

F1 (rbf Kernel): 50.87

Model with max Accuracy: Poly with an Accuracy score of 55.172

Model with max F1 Score: Linear with an F1 Score of 52.046

Model with max Balanced Accuracy Score: Linear with a Balanced Accuracy Score of 45.816

Scaled and balanced:

Best Parameters for untrained data ( linear kernel): {'C': 0.01}

Accuracy (linear Kernel): 51.37

Balanced Accuracy (linear Kernel): 53.88

F1 (linear Kernel): 45.71

Best Parameters for untrained data ( poly kernel): {'C': 0.1, 'coef0': 0.0, 'degree': 2, 'gamma': 0.1}

Accuracy (poly Kernel): 48.63

Balanced Accuracy (poly Kernel): 51.24

F1 (poly Kernel): 43.26

Best Parameters for untrained data ( rbf kernel): {'C': 0.1, 'gamma': 0.1}

Accuracy (rbf Kernel): 48.63

Balanced Accuracy (rbf Kernel): 51.24

F1 (rbf Kernel): 43.26

Model with max Accuracy: Linear with an Accuracy score of 51.37

Model with max F1 Score: Linear with an F1 Score of 45.714

Model with max Balanced Accuracy Score: Linear with a Balanced Accuracy Score of 53.879

**MCA - OPNMF**

Original:

Best Parameters for untrained data ( linear kernel): {'C': 0.1}

Accuracy (linear Kernel): 52.12

Balanced Accuracy (linear Kernel): 49.03

F1 (linear Kernel): 51.94

Best Parameters for untrained data ( poly kernel): {'C': 1e-05, 'coef0': 0.0, 'degree': 2, 'gamma': 0.0001}

Accuracy (poly Kernel): 51.35

Balanced Accuracy (poly Kernel): 33.33

F1 (poly Kernel): 34.85

Best Parameters for untrained data ( rbf kernel): {'C': 1e-05, 'gamma': 0.0001}

Accuracy (rbf Kernel): 51.35

Balanced Accuracy (rbf Kernel): 33.33

F1 (rbf Kernel): 34.85

Model with max Accuracy: Linear with an Accuracy score of 52.124

Model with max F1 Score: Linear with an F1 Score of 51.938

Model with max Balanced Accuracy Score: Linear with a Balanced Accuracy Score of 49.032

Scaled and balanced:

Best Parameters for untrained data ( linear kernel): {'C': 0.01}

Accuracy (linear Kernel): 56.55

Balanced Accuracy (linear Kernel): 58.18

F1 (linear Kernel): 53.78

Best Parameters for untrained data ( poly kernel): {'C': 10, 'coef0': 0.0, 'degree': 2, 'gamma': 0.01}

Accuracy (poly Kernel): 54.48

Balanced Accuracy (poly Kernel): 55.72

F1 (poly Kernel): 53.25

Best Parameters for untrained data ( rbf kernel): {'C': 10, 'gamma': 0.01}

Accuracy (rbf Kernel): 54.48

Balanced Accuracy (rbf Kernel): 55.72

F1 (rbf Kernel): 53.25

Model with max Accuracy: Linear with an Accuracy score of 56.552

Model with max F1 Score: Linear with an F1 Score of 53.777

Model with max Balanced Accuracy Score: Linear with a Balanced Accuracy Score of 58.184