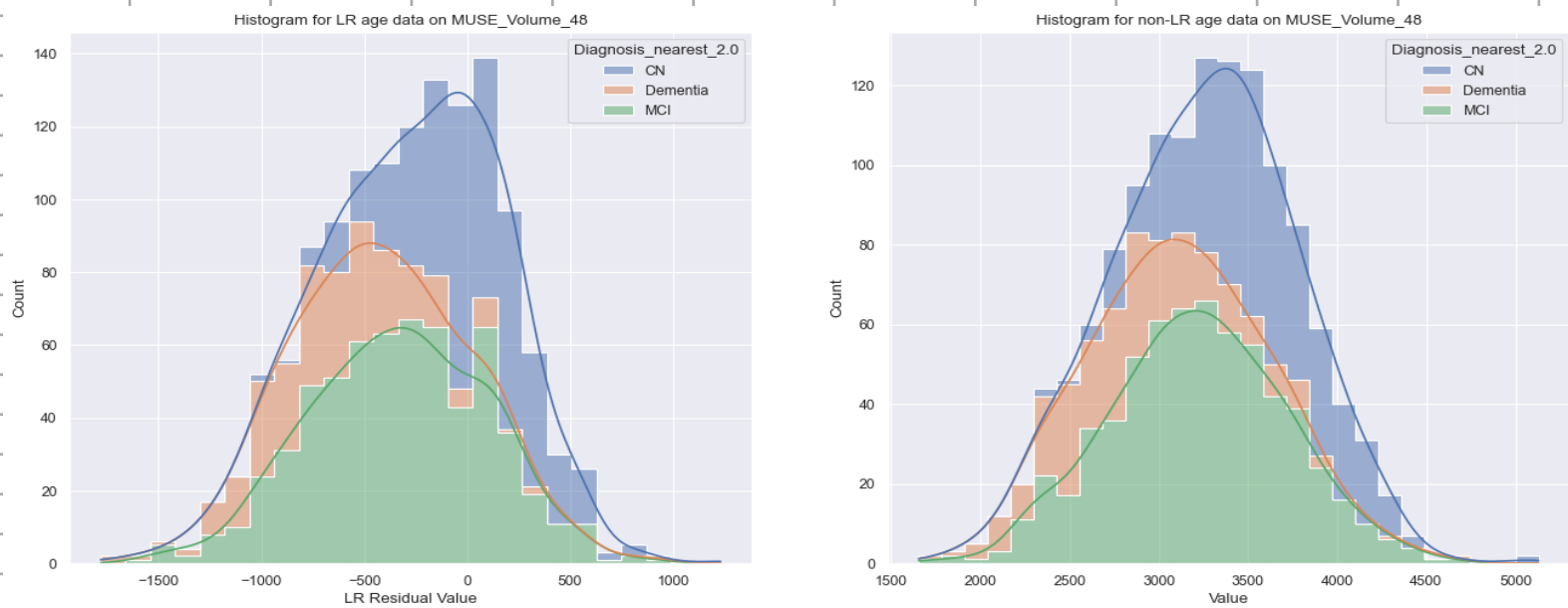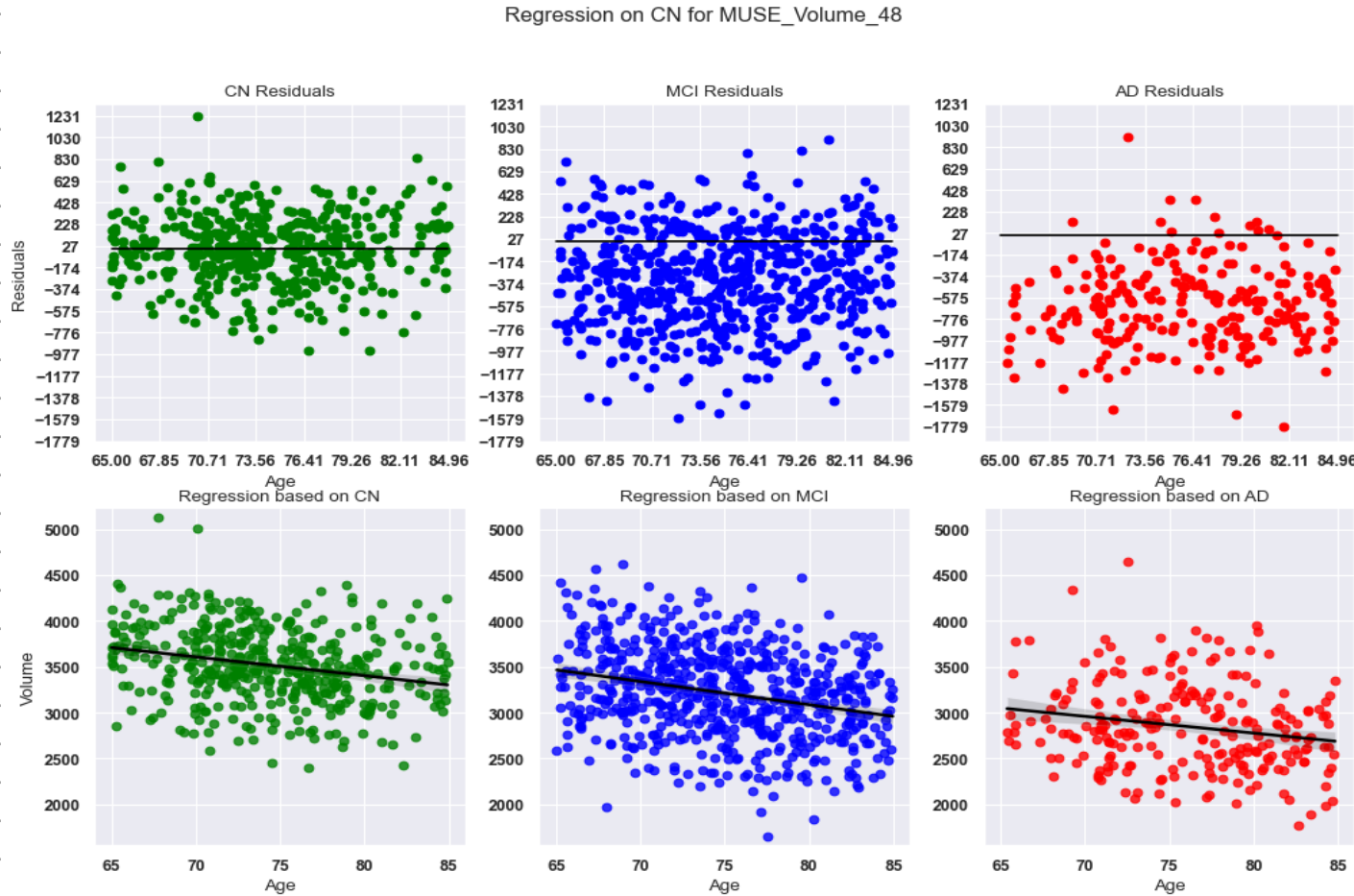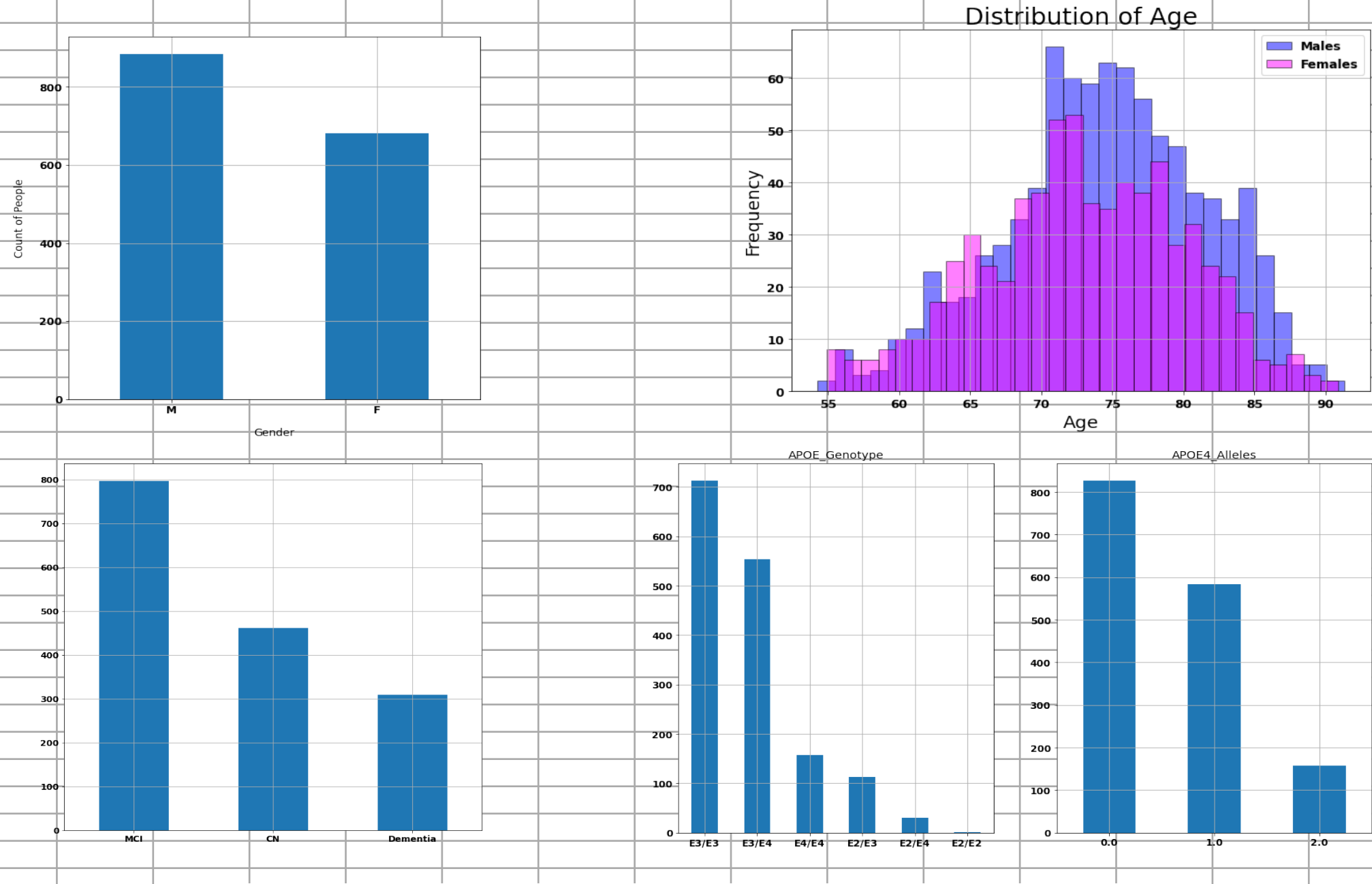# Results

Every page of this workbook contains results that are from different methods applied on the data from the ADNI Dataset. The data have been processed through Linear Regression to remove any unwanted Age, Sex, and Brain Size effect. The charts below showcase the nature of the data:

Distribution of Age

Regression on CN for MUSE_Volume_48

Raw Data

Accuracy %	Original Data							Scaled and Balanced Data						
	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM
Both Views	49.43	51.34	51.34	52.49	41	50.19	35.63	52.74	52.74	52.74	53.42	53.42	55.48	51.37
Imaging View	50.19	51.34	51.34	51.72	36.02	54.41	37.16	50	53.42	53.42	54.79	52.74	53.42	48.63
Genetic View	45.98	51.34	51.34	52.11	51.34	41.76	44.83	41.1	41.78	41.78	46.58	37.67	47.26	36.3
				47.73							49.09			

F1 Score	Original Data							Scaled and Balanced Data						
	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM
Both Views	49.33	34.83	34.83	50.66	42.26	49.05	36.94	49.42	49.49	49.49	48.51	50.2	54	45.29
Imaging View	49.99	34.83	34.83	50.47	36.02	53.82	37.73	47.8	51.12	51.12	52.39	49.16	51.13	47.39
Genetic View	41.28	34.83	34.83	46.71	34.83	38.39	40.74	38.78	40.71	40.71	36.82	37.13	42.44	32.59
				41.30							45.99			

Balanced Accuracy	Original Data							Scaled and Balanced Data						
	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM
Both Views	47.5	33.33	33.33	49.09	39.41	47.58	34.48	54.96	54.78	54.78	54.59	54.46	56.65	52.96
Imaging View	48.33	33.33	33.33	46.97	39.16	53.97	33.07	51.94	55.3	55.3	55.7	53.81	54.73	49.79
Genetic View	34.88	33.33	33.33	40.02	33.33	31.99	35.29	42.66	42.9	42.9	47.72	38.03	49.11	38.25
				38.81							50.54			

DCCA

Accuracy %

Accuracy %	Original Data							Scaled and Balanced Data						
	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM
Both Views	47.13	50.19	50.19	49.81	42.15	47.13	46.36	48.63	47.95	47.95	43.15	50	39.04	41.78
Imaging View	51.72	52.11	52.11	47.89	45.21	48.28	45.98	50	48.63	48.63	39.04	43.84	43.84	41.1
Genetic View	44.44	51.34	51.34	52.49	42.15	50.96	45.59	37.67	36.3	36.3	36.3	39.04	38.36	39.73
				48.31							42.73			

F1 Score

F1 Score	Original Data							Scaled and Balanced Data						
	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM
Both Views	46.4	38.16	38.16	38.81	42.63	42.1	46.59	47.4	47.09	47.09	38.97	48.27	38.76	39.6
Imaging View	50.8	47.76	47.76	42.31	45.15	43.36	46.01	49.01	48.08	48.08	38.58	42.63	43.9	38.05
Genetic View	40.35	34.83	34.83	40.54	41.43	46.28	44.78	36.73	35.12	35.12	35.25	38.82	38.12	39.43
				42.81							41.62			

Balanced Accuracy

Balanced Accuracy	Original Data							Scaled and Balanced Data						
	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM
Both Views	42.04	33.73	33.73	33.8	37.05	36.52	44.85	49.97	49.13	49.13	43.98	50.64	39.74	43.38
Imaging View	45.82	40.45	40.45	35.61	42.85	36.21	45.25	51.37	49.6	49.6	39.4	44.55	43.77	42.28
Genetic View	33.89	33.33	33.33	35.54	35.92	39.04	38.3	38.6	37.41	37.41	35.87	39.32	38.8	40.54
				37.99							43.55			

MCA

Accuracy %

Accuracy %	Original Data							Scaled and Balanced Data						
	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM
Both Views	50.19	51.34	51.34	51.72	42.91	49.81	37.16	57.53	59.59	59.59	54.11	52.05	53.42	49.32
Imaging View														
Genetic View	49.04	51.34	51.34	51.72	49.81	48.28	49.81	37.67	30.14	30.14	31.51	35.62	30.82	38.36
				48.99							44.28			

F1 Score

F1 Score	Original Data							Scaled and Balanced Data						
	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM
Both Views	49.99	34.83	34.83	49.25	43.96	49.62	36.25	52.6	57.85	57.85	50.29	48.15	52.36	48.43
Imaging View														
Genetic View	35.19	34.83	34.83	36.96	35.01	35.24	34.92	37.21	13.96	13.96	27.62	33.61	30.6	38.45
				38.98							40.21			

Balanced Accuracy

Balanced Accuracy	Original Data							Scaled and Balanced Data						
	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM
Both Views	48.33	33.33	33.33	47.17	40.35	48.08	35.59	57.24	59.41	59.41	56.38	54.67	53.98	49.88
Imaging View														
Genetic View	32.17	33.33	33.33	34.38	32.5	31.83	32.5	37.4	33.33	33.33	33.69	37.37	30.72	38.3
				36.87							45.37			

MCA + DCCA

Accuracy %

Accuracy %	Original Data							Scaled and Balanced Data						
	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM
Both Views	46.36	50.96	50.96	44.44	45.59	46.74	49.81	40.41	37.67	37.67	45.89	41.1	45.21	42.47
Imaging View	42.91	47.89	47.89	46.36	46.74	47.13	41.38	50	41.48	41.48	43.15	52.05	45.21	45.21
Genetic View	39.08	51.34	51.34	51.34	43.68	43.68	42.53	40.41	34.93	34.93	31.51	33.56	38.36	38.36
				46.58							41.00			

F1 Score

F1 Score	Original Data							Scaled and Balanced Data						
	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM
Both Views	46.75	36.52	36.52	38.82	46.03	41.42	49.71	39.99	37.69	37.69	35.49	40.55	35.86	42.08
Imaging View	41.7	40.13	40.13	41.77	46.92	39.33	41.1	48.48	40.4	40.4	42.82	50.1	35.86	36.71
Genetic View	39.39	34.83	34.83	35.5	43.45	38.87	42.86	40.14	34.88	34.88	29.45	33.73	37.57	37.65
				40.79							38.69			

Balanced Accuracy

Balanced Accuracy	Original Data							Scaled and Balanced Data						
	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM
Both Views	46.9	33.57	33.57	32.42	45.46	35.07	45.04	41.01	37.91	37.91	48.56	41.28	46.31	42.66
Imaging View	37.47	34.63	34.63	35.96	46.19	33.2	40.13	51.84	43.13	43.13	43.62	53.37	46.31	46.27
Genetic View	34.05	33.33	33.33	33.5	37.51	32.43	41.05	41.41	35.27	35.27	30.15	33.41	38.62	38.64
				37.12							41.72			

OPNMF

Accuracy %	Original Data							Scaled and Balanced Data						
	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM
Both Views	51.74	51.35	51.35	47.49	52.9	48.26	53.28	48.28	28.97	28.97	49.66	55.17	48.26	53.28
Imaging View	53.28	51.35	51.35	46.33	51.35	51.74	53.28	51.03	28.97	28.97	55.86	58.62	51.74	53.28
Genetic View				51.08							45.79			

F1 Score	Original Data							Scaled and Balanced Data						
	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM
Both Views	51.51	34.85	34.85	46.33	50.03	47.98	51.46	44.16	13.01	13.01	47.28	49.4	47.98	51.46
Imaging View	53.16	34.85	34.85	45.86	50.52	51.46	51.46	48.08	13.01	13.01	53.45	54.2	51.46	51.46
Genetic View				45.66							39.36			

Balanced Accuracy	Original Data							Scaled and Balanced Data						
	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM
Both Views	48.64	33.33	33.33	41.57	44.51	46.72	45.3	52.55	33.33	33.33	50.93	57.69	46.72	45.3
Imaging View	50.26	33.33	33.33	42.9	45.78	48.71	45.3	54.79	33.33	33.33	57.57	61.01	48.71	45.3
Genetic View				42.36							46.71			

OPNMF + DCCA

Accuracy %

Accuracy %	Original Data							Scaled and Balanced Data						
	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM
Both Views	45.95	47.88	47.88	50.58	40.93	**52.9**	46.33	49.66	49.66	49.66	44.14	46.9	48.97	**53.79**
Imaging View	48.65	49.42	49.42	50.97	47.49	43.24	50.19	49.66	49.66	49.66	43.45	50.34	47.59	51.03
Genetic View	45.95	45.56	45.56	50.58	45.17	51.35	45.56	40.69	40.69	40.69	35.86	35.17	38.62	45.52
				47.69							45.78			

F1 Score

F1 Score	Original Data							Scaled and Balanced Data						
	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM
Both Views	46.08	47.25	47.25	42.38	40.56	**50.14**	46.2	46.52	49.03	49.03	43.68	42.04	48.93	**53.38**
Imaging View	48.78	48.36	48.36	48.27	47.33	40.79	50.06	45.55	48.54	48.54	42.13	46.74	46.81	48.01
Genetic View	44.72	43.87	43.87	36.34	43.71	46.94	43.69	40.69	40.7	40.7	35.86	34.52	38.28	45.52
				45.47							44.53			

Balanced Accuracy

Balanced Accuracy	Original Data							Scaled and Balanced Data						
	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM
Both Views	44.5	43.08	43.08	36.1	38.11	43.42	47.34	51.4	50.95	50.95	45.2	49.62	49.56	**55.03**
Imaging View	47.06	43.25	43.25	41.55	46.86	34.14	**53.33**	51.45	50.95	50.95	45.2	52.71	49.17	48.01
Genetic View	38.6	37.57	37.57	33.33	37.15	39.38	37.38	41.2	40.97	40.97	35.95	36.29	39.45	45.33
				41.24							46.73			

MCA + OPNMF

Accuracy %

Accuracy %	Original Data							Scaled and Balanced Data						
	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM
Both Views	52.12	51.35	51.35	48.26	**55.6**	44.79	53.28	56.55	54.48	54.48	46.9	55.86	55.17	**57.24**
Imaging View														
Genetic View														
				50.96							54.38			

F1 Score

F1 Score	Original Data							Scaled and Balanced Data						
	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM
Both Views	51.94	34.85	34.85	47.26	**52.56**	43.94	51.46	53.78	53.25	53.25	38.87	52.91	**54.79**	53.68
Imaging View														
Genetic View														
				45.27							51.50			

Balanced Accuracy

Balanced Accuracy	Original Data							Scaled and Balanced Data						
	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM
Both Views	**49.03**	33.33	33.33	42.35	45.5	39.15	45.3	58.18	55.72	55.72	49.58	57.86	54.87	**58.25**
Imaging View														
Genetic View														
				41.14							55.74			

FAMD

Accuracy %	Original Data							Scaled and Balanced Data						
	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM
Both Views	54.41	**55.17**	**55.17**	49.43	53.26	52.87	53.26	51.37	48.63	48.63	43.84	50.68	47.26	50.68
Imaging View														
Genetic View														
				53.37							48.73			

F1 Score	Original Data							Scaled and Balanced Data						
	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM
Both Views	**52.05**	44.42	44.42	48.31	49.5	51.75	51.83	45.71	43.26	43.26	41.6	**46.81**	44.53	46.21
Imaging View														
Genetic View														
				48.90							44.48			

Balanced Accuracy	Original Data							Scaled and Balanced Data						
	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM	Linear K	Poly K	RBF K	Bagging DT	Bagging SVM	AdaBoost DT	AdaBoost SVM
Both Views	45.82	**50.87**	**50.87**	43.52	42.33	46.57	45.98	**53.88**	51.24	51.24	45.41	52.66	49.73	53.77
Imaging View														
Genetic View														
				46.57							51.13			

Model	Best Accuracy (%)	Best F1 Score (%)	Best Balanced Accuracy (%)	Notes
RAW DATA	55.48	54.00	56.65	145 ROIs (Scaled) and 54 SNPs (Balanced). Both AdaBoost DT.
DCCA-150-3	51.72	50.80	45.82	Output Dimension 150, 3 Hidden Layers, no scaling or balancing. Imaging Linear.
OPNMF	58.62	54.02	61.01	30 Imaging Components (After OPNMF) Balanced only. Imaging Bagging SVM.
OPNMF + DCCA-150-3	53.79	53.38	55.03	30 Imaging Components (After OPNMF) and 54 SNPs, then DCCA, then scaled and balanced. Both AdaBoost SVM.
MCA	59.59	57.85	59.41	145 ROIs (Scaled), 10 Genetic components, Balanced only. Both Poly SVM.
MCA + DCCA-150-3	52.05	50.10	53.37	145 ROIs and 10 Genetic components (After MCA), then DCCA, then scaled and balanced. Imaging Bagging SVM.
MCA + OPNMF	57.24	53.68	53.77	30 Imaging Components (After OPNMF) and 10 Genetic components (After MCA), Balanced only. Both AdaBoost SVM.
FAMD	55.17	44.42	50.87	10 Components, no scaling, no balancing. Both Poly / RBF SVM.

Best Scores for each Model