Model	Parameter							Average FDR at 3%			
Logistic regression	**# of variables**	**penalty**	**C**	**Solver**		**l1_ratio**		**Train**	**Test**	**OOT**	
1	10	none	none	none		none		0.485405	0.487786	0.471081	
2	10	l1	none	saga		none		0.487824	0.488927	0.473931	
3	10	l2	1	saga		none		0.488076	0.488086	0.473764	
4	10	elasticnet	none	saga		0.4		0.486106	0.480378	0.469153	
5	10	none	none	liblinear		0.4		0.489868	0.484578	0.474099	
6	5	none	none	liblinear		0.4		0.477955	0.475607	0.463286	
Decision Tree	**# of variables**	**Max_depth**		**min_sample_split**		**min_sample_leafs**		**Train**	**Test**	**OOT**	
1	10	5		50		30		0.51256	0.511225	0.489187	
2	10	10		40		20		0.531522	0.518441	0.506119	
3	10	15		30		10		0.532135	0.523659	0.503521	
4	10	20		20		5		0.539516	0.516225	0.501341	
5	10	30		10		3		0.539554	0.519933	0.49715	
6	5	30		10		3		0.532687	0.520083	0.499749	
7	20	30		10		3		0.545973	0.514263	0.499581	
Random Forest	**# of variables**	**n_estimators**	**max_depth**	**min_sample_split**		**min_samples_leaf**	**max_features**	**Train**	**Test**	**OOT**	
1	10	10	5	50		30	3	0.51525	0.519802	0.493965	
2	10	30	15	40		20	5	0.531948	0.527312	0.504107	
3	10	50	25	30		10	8	0.539951	0.521735	0.501509	
4	10	100	30	20		5	10	0.539889	0.522605	0.500671	
5	15	100	30	20		5	10	**0.543988**	**0.516966**	0.500671	OVERFITTING
LightGBM	**# of variables**	**n_estimators**	**max_depth**	**num_leaves**	**col_samplebytree**	**learning_rate**	**eval_metric**	**Train**	**Test**	**OOT**	
1	10	20	2	2	1	0.1	none	0.511695	0.512854	0.488852	
2	10	100	3	4	0.8	0.03	auc	0.509624	0.50829	0.485163	
3	10	500	5	8	0.8	0.01	auc	0.521047	0.528574	0.502012	
4	10	1000	6	10	0.8	0.01	logloss	0.529548	0.523249	0.506203	
5	15	1000	6	10	0.8	0.01	logloss	0.531117	0.519609	0.504694	
Neural Network	**# of variables**	**hidden_layer_size**	**activation**	**alpha**	**learning_rate**	**solver**	**learning_rate_init**	**Train**	**Test**	**OOT**	
1	10	5	logistic	0.1	constant	adam	0.01	0.498557	0.497713	0.479212	
2	10	10	relu	0.001	constant	adam	0.001	0.526276	0.523445	0.50285	
3	10	20	relu	0.0001	adaptive	lbfgs	0.0001	0.529691	0.520945	0.506119	
4	20	20	relu	0.0001	adaptive	lbfgs	0.0001	0.525618	0.529903	0.507544	
5	15	20	relu	0.0001	adaptive	lbfgs	0.0001	0.528445	0.524422	0.505616	
6	15	(20,20,20)	logistic	0.0001	constant	lbfgs	0.0001	**0.467195**	**0.468398**	**0.45482**	UNDERFITTING
GBC	**# of variables**	**n_estimators**	**max_depth**	**min_samples_leaf**		**subsample**		**Train**	**Test**	**OOT**	
1	10	10	5	1		1		0.526357	0.517669	0.501509	
2	10	50	10	3		0.8		0.53505	0.524572	0.501844	
3	10	100	15	5		0.5		0.541146	0.519249	0.499162	
4	5	100	15	5		0.5		0.534136	0.517501	0.500671	
5	15	100	15	5		0.5		**0.543792**	**0.516226**	0.499329	OVERFITTING
Catboost	**# of variables**	**bootstrap_type**	**verbose**	**max_depth**		**iteration**	**random_state**	**Train**	**Test**	**OOT**	
1	10	none	0	2		5	None	0.540728	0.543309	0.513412	
2	10	Bayesian	0	5		10	10	0.522148	0.52321	0.500503	

3	10	Bayesian	0	16	15	10	0.526529	0.523115	0.501928	
4	10	MVS	0	16	20	5	0.528429	0.523049	0.503521	
5	20	MVS	0	16	20	5	0.531203	0.524023	0.504946	
XGBoost	**# of variables**	**max_depth**	**n_estimators**	**tree_method**	**subsample**		**Train**	**Test**	**OOT**	
1	10	2	5	auto	1		0.542421	0.543366	0.515507	
2	10	10	50	approx	0.8		0.530224	0.524862	0.507376	
3	10	20	100	auto	0.5		0.5378	0.524138	0.501425	
4	5	30	100	auto	0.5		0.529266	0.525789	0.5	
5	15	30	1000	hist	1		**0.545249**	**0.510646**	0.498324	**OVERFITTING**