Stratified 10-fold CV results of VM11 (Strong Machine)

On the next few pages you find the averaged scores of the stratified 10-fold cross-validation (CV). Below you find some meta data about the analysis:

- VM11: 16 vCPUs with 128 GB of RAM
- 3 sub-data sets with same rows and columns except of the labels (flaky vs. non-flaky):
  - own: Only the tests which are observed as flaky by my own are labeled as flaky
  - iDFlakies: Only the tests provided in the data from ‘IDFlakies’ are labeled as flaky
  - union: The union of the previous two are taken
  - NOTE: The intersection has too less common labeled flaky tests
- For each sub-data set 4 different CV were done:
  1. Corelation-based Feature subset selection (CFS) – No balancing
  2. CFS – Balancing
  3. no CFS – Balancing
  4. no CFS – No balancing
- The used models are the following:
  - Linear Discriminant Analysis (LDA)
  - Quadratic Discriminant Analysis (QDA)
  - Gaussian Naive Bayes (gnbayes)
  - Logistic Regression (logreg)
  - Classification Tree (ctree)
  - Random Forest (rforest)
  - Ada Boosting (adaboost)
  - Extreme Gradient Boosting (xgboost)
- The average of the following scores are taken:
  - Accuracy (acc)
  - Precision (prec)
  - Recall (reca)
  - F1 (f1)
  - Matthews correlation coefficient (mcc)
  - Area under the ROC curve (auc)

Own identified flaky tests

No CFS – Not Balanced

	acc	prec	reca	f1	mcc	auc
lda	0.99440370058873	0.235084318127834	0.908256880733945	0.373380349695772	0.460420283991756	0.951409409679927
qda	0.956894869638352	0.040965659274323	0.981651376146789	0.078586646614035	0.195522992824284	0.969250386005684
gnbayes	0.573813288477712	0.004085137456057	0.953211009174312	0.008135406866182	0.045510355195957	0.763163702123429
logreg	0.998126156433978	0.471836348656378	0.207339449541284	0.286767572237837	0.311145882005216	0.603459077831763
ctree	0.999722455845248	0.926108395345002	0.922935779816514	0.924180961287286	0.924213115515567	0.96139964030006
rforest	0.99971236333053	0.929605079778236	0.912844036697248	0.92077259082181	0.920855290424337	0.956357981679205
adaboost	0.999771236333053	0.977280779486671	0.896330275229358	0.93472126673672	0.935651510439447	0.948145758096302
xgboost	0.99979142136249	0.984274476678235	0.90091743119266	0.940371338004406	0.941382018076436	0.950445234192242

No CFS – Balanced

	acc	prec	reca	f1	mcc	auc
lda	0.973394495412844	0.967548887246007	0.979816513761468	0.973563036496242	0.947025476557441	0.973394495412844
qda	0.970183486238532	0.972460254311048	0.967889908256881	0.970064200619077	0.940576195080157	0.970183486238532
gnbayes	0.773394495412844	0.699072349990471	0.963302752293578	0.80991003879038	0.59132640816856	0.773394495412844
logreg	0.962385321100917	0.970327921432924	0.954128440366972	0.962017956618577	0.925154516532716	0.962385321100917
ctree	0.994495412844037	0.99359450776882	0.995412844036697	0.994495354929057	0.989007428680983	0.994495412844037
rforest	0.997247706422018	0.995446205170976	0.99908256880734	0.997256084789075	0.994512093060169	0.997247706422018
adaboost	0.995412844036697	0.992759139009139	0.998165137614679	0.995433561439124	0.99088331521172	0.995412844036697
xgboost	0.996788990825688	0.994545454545454	0.99908256880734	0.996799444479515	0.993607172029607	0.996788990825688

CFS – Not Balanced

	acc	prec	reca	f1	mcc	auc
lda	0.991128679562658	0.160372365021561	0.904587155963303	0.272399380184504	0.378774693262608	0.94793739928564
qda	0.988610597140454	0.130622180906577	0.920183486238532	0.228743951519988	0.344325797874967	0.954459886561406
gnbayes	0.976622371740959	0.068096055129205	0.925688073394495	0.126853583448052	0.247613750756397	0.951202001679301
logreg	0.997984861227923	0	0	0	-0.000574187451791	0.499909000522404
ctree	0.999683767872162	0.930612998115327	0.894495412844037	0.911913875999744	0.912076704732495	0.947186197515866
rforest	0.999703952901598	0.935574394602405	0.90091743119266	0.917602969783391	0.917777239293033	0.950401419628955
adaboost	0.999365853658536	0.855661276150475	0.787155963302752	0.819202542138129	0.819990741017965	0.893455806426826
xgboost	0.999594617325484	0.917487366064336	0.855963302752294	0.885527356501308	0.885925281685342	0.927910874004684

CFS – Balanced

	acc	prec	reca	f1	mcc	auc
lda	0.952293577981651	0.978954837687986	0.924770642201835	0.950816202481428	0.906394621590373	0.952293577981652
qda	0.944495412844037	0.967274159227653	0.920183486238532	0.94296424003467	0.890316451043361	0.944495412844037
gnbayes	0.947706422018349	0.967834911485128	0.926605504587156	0.94646337953146	0.896718846310094	0.947706422018349
logreg	0.94908256880734	0.97050065644852	0.926605504587156	0.947777653236044	0.899505676170632	0.94908256880734
ctree	0.988990825688073	0.984681876432948	0.993577981651376	0.989044292673173	0.978153475981641	0.988990825688073
rforest	0.988532110091743	0.983757730982502	0.993577981651376	0.988592223520784	0.977216322459499	0.988532110091743
adaboost	0.986238532110092	0.982847164323006	0.989908256880734	0.98628757555553	0.972656468996058	0.986238532110092
xgboost	0.988073394495413	0.98297020572595	0.993577981651376	0.988151575474776	0.976392256967435	0.988073394495413

Entries from iDFlakies are labeled as flaky only

No CFS – Not Balanced

	acc	prec	reca	f1	mcc	auc
lda	0.976179983179142	0.144534392989305	0.248203501748912	0.182644368848821	0.177920205326197	0.616141613804864
qda	0.19859882253995	0.01301600467925	0.982135340780314	0.025690510790862	0.045490827285807	0.586115726079668
gnbayes	0.576107653490328	0.017965645193305	0.717173679485481	0.035053151765964	0.060756237768491	0.645875274986188
logreg	0.98925315391085	0.5	0	0	-0.000244893535794	0.499994048819115
ctree	0.995900756938604	0.812202451806419	0.804293787805201	0.808196304364305	0.806151067104103	0.901136892213375
rforest	0.995954583683768	0.828893147098802	0.785491878473909	0.806541431647829	0.804830478197715	0.891865163280659
adaboost	0.990513036164844	0.711841355812126	0.198535623353496	0.306847022162137	0.369106054431724	0.598821472792378
xgboost	0.993195962994113	0.932894123515449	0.394555069882899	0.554250089316657	0.604129226292394	0.697123654087054

No CFS – Balanced

	acc	prec	reca	f1	mcc	auc
lda	0.782747144438744	0.852149784108737	0.684266904106632	0.758940212407696	0.576871593206762	0.782749177054665
qda	0.656773933813331	0.627063856128627	0.896567913226485	0.721898404987716	0.382123272176451	0.656779303476729
gnbayes	0.627311820170217	0.599051505927022	0.770136282690921	0.673891149815415	0.265700879965709	0.627312096192621
logreg	0.732371619415607	0.802229530005442	0.616891842171104	0.697232844342812	0.477792985998912	0.732372167522726
ctree	0.972031026381876	0.961848639200488	0.983075779651788	0.972331976959122	0.944322092314713	0.972030528696386
rforest	0.98519275191905	0.974876191049408	0.996081749991415	0.985355578372524	0.970634590626949	0.985192135046433
adaboost	0.864541391829891	0.87818822693107	0.846758012372388	0.862050184043973	0.729759747493924	0.864541480860082
xgboost	0.913664655356525	0.91353026604946	0.913978296809768	0.913688380685636	0.827449605345998	0.913664817185944

CFS – Not Balanced

	acc	prec	reca	f1	mcc	auc
lda	0.983431455004205	0.141945472212175	0.107490151637796	0.122254156282944	0.115221048572114	0.550213471585054
qda	0.978206896551724	0.116738041628935	0.156695659852532	0.133744056084656	0.124345507439516	0.571908645660675
gnbayes	0.964114381833473	0.059943261264664	0.159516731177732	0.087131031706465	0.081877608966039	0.566181158365383
logreg	0.989264928511354	1	0	0	0	0.5
ctree	0.992893187552565	0.701258736990864	0.589003438954872	0.640153252653778	0.639111650009403	0.79313974745789
rforest	0.993123633305299	0.722539493859395	0.58352048900859	0.645525683561544	0.645887879189003	0.790544501969553
adaboost	0.990142977291842	0.8943164452594	0.093387738482445	0.168696536040144	0.286213327307415	0.546630956664655
xgboost	0.990659377628259	0.91852740657247	0.142744344857021	0.246922612912629	0.359838112309203	0.571302458461058

CFS – Balanced

	acc	prec	reca	f1	mcc	auc
lda	0.609215184000511	0.615408770073944	0.582424046192866	0.598392314889898	0.218789812425151	0.609217355684087
qda	0.559622376111723	0.773519865559817	0.16860273448423	0.276761808641074	0.19128795462009	0.559622573476386
gnbayes	0.58688577509494	0.819782981033747	0.222661780505394	0.350140772311892	0.253566529652342	0.586887206204836
logreg	0.627312249762497	0.624315281282372	0.639613227957084	0.631816322250809	0.254749618814315	0.627314426440216
ctree	0.893217167489438	0.879403004539296	0.911784184732218	0.895156767252025	0.787251263135638	0.893216281317301
rforest	0.904969339385266	0.885937809356654	0.929963550021831	0.907295837073036	0.811189711069953	0.904969559607733
adaboost	0.742948979166002	0.756545618554501	0.717172453039379	0.736023441277819	0.486918874186366	0.742950265157647
xgboost	0.784628881366251	0.78990629372148	0.776093621989688	0.782719761618073	0.569641866797308	0.784630300086832

Union of own identified flaky tests and from iDFlakies data

No CFS – Not Balanced

	acc	prec	reca	f1	mcc	auc
lda	0.975979814970563	0.145855290610131	0.249461195036869	0.183984736377019	0.179132477378138	0.616712408752387
qda	0.194354920100925	0.013047241668805	0.968590446021408	0.025742262173223	0.04138777068913	0.577218775653888
gnbayes	0.918023549201009	0.049833807943781	0.361810403816615	0.08759379531117	0.109972504074705	0.64297313096726
logreg	0.989116904962153	0.3	0	0	-0.000318751437306	0.49999319772719
ctree	0.995643397813289	0.803270115350039	0.793867624329484	0.798422839102793	0.796295548819516	0.895864153785775
rforest	0.995798149705635	0.825155044380193	0.778698302716515	0.801082064004509	0.799390849631635	0.888441047135652
adaboost	0.990464255677039	0.738755899540114	0.194822256568779	0.304154368979223	0.371983082498893	0.597014894696677
xgboost	0.993071488645921	0.93827492887945	0.388266397423689	0.548996503512259	0.601037396610374	0.693992051446211

No CFS – Balanced

	acc	prec	reca	f1	mcc	auc
lda	0.775687256218888	0.84145279044712	0.679511295285217	0.751768358131725	0.561955536867489	0.775686784923031
qda	0.719050663371955	0.919394326214644	0.482213454811681	0.629735149157418	0.49866865658176	0.719053526397136
gnbayes	0.645853955210122	0.623906038183472	0.734914178800944	0.674820713691622	0.296495279228268	0.645854647073179
logreg	0.730034850672471	0.802799090503188	0.610028423636599	0.693041234071699	0.474058668924494	0.73003658227303
ctree	0.970906572422595	0.961611722772618	0.981117661414195	0.971219357341187	0.942104305484484	0.970904651619047
rforest	0.984602312044613	0.975369303896576	0.994428919375446	0.984775305056652	0.969454703332287	0.98460218871572
adaboost	0.86072116109846	0.869143326518855	0.849420760739015	0.859070946665408	0.721782377671871	0.860718558146434
xgboost	0.908463649228161	0.909079521043946	0.907766495518731	0.908387181947423	0.816991954132785	0.908462850689776

CFS – Not Balanced

	acc	prec	reca	f1	mcc	auc
lda	0.983350714886459	0.143001849862238	0.106624286418383	0.122090118521946	0.115157696878128	0.549804717439991
qda	0.977947855340622	0.116872459162685	0.156763294270771	0.133894636287382	0.124338111098679	0.571867612880176
gnbayes	0.964011774600504	0.061046371859692	0.160631588517616	0.088463451017977	0.083028363842077	0.566735890775662
logreg	0.989130361648444	1	0	0	0	0.5
ctree	0.992602186711522	0.690698432950916	0.579068432058417	0.629826757187097	0.628678863026428	0.788107437843332
rforest	0.992768713204373	0.706579826685341	0.573499983252066	0.632864344980277	0.632880131526178	0.785438001983604
adaboost	0.989838519764508	0.808287191625774	0.092850546221905	0.163394890913147	0.257605001368609	0.546273072161041
xgboost	0.990659377628259	0.90672778203277	0.156918332288581	0.267353146974187	0.374816875777951	0.578369886156414

CFS – Balanced

	acc	prec	reca	f1	mcc	auc
lda	0.623878936114683	0.627154457387953	0.611114168273671	0.618932163369823	0.247910271048638	0.623879682841981
qda	0.55988946195159	0.769903620962329	0.170999038190075	0.27969435698607	0.190630852859363	0.559889894296611
gnbayes	0.585501234319592	0.812074045497411	0.222532431177954	0.349158563394228	0.248608453376077	0.585499877979338
logreg	0.626666032147381	0.622600299292163	0.643303458209119	0.632719692978692	0.253530420459915	0.626667854972462
ctree	0.885331410620177	0.871668631220845	0.903900354577689	0.887406984264013	0.771354321309046	0.885329766820907
rforest	0.901270594939649	0.885006507491564	0.922626458864682	0.903354161147382	0.803407730316266	0.901269493398921
adaboost	0.746208567686447	0.762438529389085	0.716187835257751	0.738137545745563	0.493821339524308	0.746206114431456
xgboost	0.780950114812075	0.793641762635173	0.759512108756298	0.776101375756064	0.562550899014386	0.780949344677267