

SUPPLEMENTARY INFORMATION

All analysis scripts used are available online on GitHub <https://github.com/jameshughes89/SmartwatchGPModelling2>.

All supplementary material is currently made available online and can be found on the project's GitHub page. A more appropriate location will be used for the final version and referenced accordingly, however GitHub is currently used to easily provide the material for the benefit of the chairs, editors, and reviewers.

TABLE V: Summary of subject details.

	Sex	Age	Mass	Height
User 1	Male	26	60kg	173cm
User 2	Male	22	65kg	174cm
User 3	Female	21	54kg	159cm
User 4	Female	20	50kg	163cm
User 5	Male	23	63kg	170cm
User 6	Female	21	55kg	163cm

TABLE VI: Mean Number of time points for each task over all 5 takes per subject and average number of time points for each task over all 6 subjects and 5 tasks.

Task	Subject	Avg. Pts./Sub. & Task	Avg. Pts./Task
Up	1	386.8	407.1
	2	482.0	
	3	376.4	
	4	404.8	
	5	253.6	
	6	539.0	
Down	1	186.0	339.17
	2	480.8	
	3	296.0	
	4	365.4	
	5	200.6	
	6	506.2	
Walking	1	1637.6	1685.3
	2	1708.0	
	3	1712.0	
	4	1691.4	
	5	1578.4	
	6	1784.4	
Jogging	1	1664.0	1681.77
	2	1671.0	
	3	1754.2	
	4	1644.2	
	5	1556.4	
	6	1800.8	
Running	1	328.0	300.0
	2	246.8	
	3	348.6	
	4	224.8	
	5	205.4	
	6	446.4	

TABLE VII: Settings for Genetic Programming. The values for migrations and generations *per* migration were reduced to 100 each when performing the analysis on models fit to a subset of data.

Elitism	1
Population	101/subpopulation (707 total)
Subpopulations	7
Migrations	1,000
Generations	1,000 <i>per</i> migration (1,000,000 total)
Mutation	10% (x2 chances per selection)
Crossover	80%
Trainers	8
Predictors	20
Predictor Pop. Size	20% of Dataset
Max # Graph Nodes	40
Fitness Metric	Mean Squared Error: $\frac{1}{n} \sum_{i=1}^n (y_i - \hat{y}_i)^2$
Language	$+$, $-$, $*$, $/$, <i>exp</i> , <i>abs</i> , <i>sin</i> , <i>cos</i> , <i>tan</i>

$$gyr_z = \sin(2\sin(acc_x)) \left(\frac{-7.873 + e^{gyr_x} + gyr_y}{(7.873 + e^{gyr_y})} * 0.226347 * e^{-gyr_x} \right) * \sin(acc_x) + \frac{\sin^2(acc_x)}{-3.997 - gyr_y} + \frac{4.418 * (gyr_y - 0.226347 * e^{-gyr_x} * \sin(acc_x))}{7.873 + e^{gyr_y}} \quad (1)$$

Fig. 11: Example expression generated with symbolic regression. The expression generated is for Subject 6's second take on the running task (see figure 1).

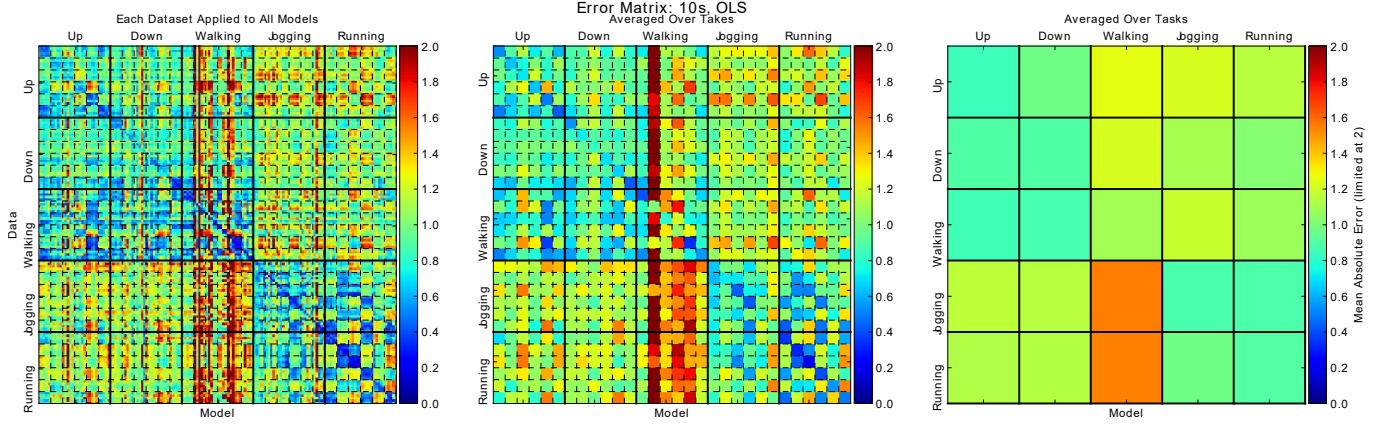


Fig. 12: Error Matrix of OLS regression fit to 10s of data.

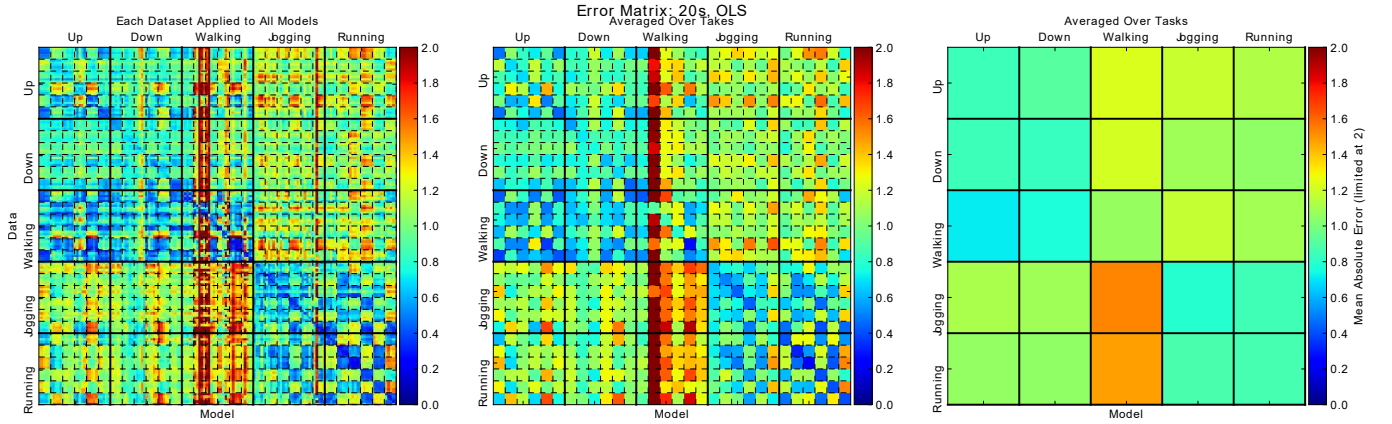


Fig. 13: Error matrix of OLS regression fit to 20s of data.

TABLE VIII: Classification accuracy and 95% confidence interval when the classifier was built with OLS given all of the data and was given 5s of data to classify. Overall accuracy was 73.7%, task accuracy was 83.8% (walking like was 97.9% and running like was 99.8%), and subject accuracy was 79.2%.

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Identify Subject
Up	0.602 ± 0.144	0.72 ± 0.099	0.398 ± 0.046	0.6 ± 0.212	0.42 ± 0.289	0.58 ± 0.093	0.726 ± 0.084
Down	0.834 ± 0.148	0.598 ± 0.108	0.58 ± 0.242	0.67 ± 0.181	0.748 ± 0.122	0.776 ± 0.301	0.836 ± 0.066
Walking	0.842 ± 0.054	0.598 ± 0.159	0.588 ± 0.198	0.796 ± 0.115	0.926 ± 0.031	0.962 ± 0.037	0.839 ± 0.057
Jogging	0.778 ± 0.194	0.868 ± 0.073	0.672 ± 0.297	0.934 ± 0.041	0.674 ± 0.119	0.712 ± 0.066	0.908 ± 0.044
Running	0.548 ± 0.292	0.972 ± 0.037	0.996 ± 0.007	0.916 ± 0.029	0.986 ± 0.012	0.838 ± 0.104	0.88 ± 0.074
Identify Subject	0.734 ± 0.111	0.786 ± 0.137	0.684 ± 0.151	0.852 ± 0.103	0.811 ± 0.133	0.884 ± 0.092	

TABLE IX: Classification accuracy and 95% confidence interval when the classifier was built with OLS given 20s of data and was given 5s of data to classify. Overall accuracy was 43.3%, task accuracy was 61.1% (walking like was 95.8% and running like was 99.6%), and subject accuracy was 55.8%.

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Identify Subject
Up	0.828 ± 0.134	0.04 ± 0.008	0.03 ± 0.029	0.53 ± 0.27	0.668 ± 0.281	0.388 ± 0.233	0.685 ± 0.094
Down	0.72 ± 0.186	0.1 ± 0.032	0.328 ± 0.146	0.37 ± 0.158	0.852 ± 0.155	0.658 ± 0.325	0.682 ± 0.081
Walking	0.518 ± 0.294	0.008 ± 0.009	0.08 ± 0.063	0.152 ± 0.133	0.478 ± 0.217	0.042 ± 0.025	0.342 ± 0.089
Jogging	0.192 ± 0.204	0.208 ± 0.183	0.334 ± 0.249	0.324 ± 0.113	0.004 ± 0.004	0.0 ± nan	0.406 ± 0.106
Running	0.79 ± 0.268	1.0 ± 0.0	0.864 ± 0.118	0.734 ± 0.156	0.818 ± 0.121	0.934 ± 0.068	0.943 ± 0.056
Identify Subject	0.719 ± 0.121	0.37 ± 0.352	0.477 ± 0.294	0.533 ± 0.114	0.73 ± 0.3	0.521 ± 0.263	

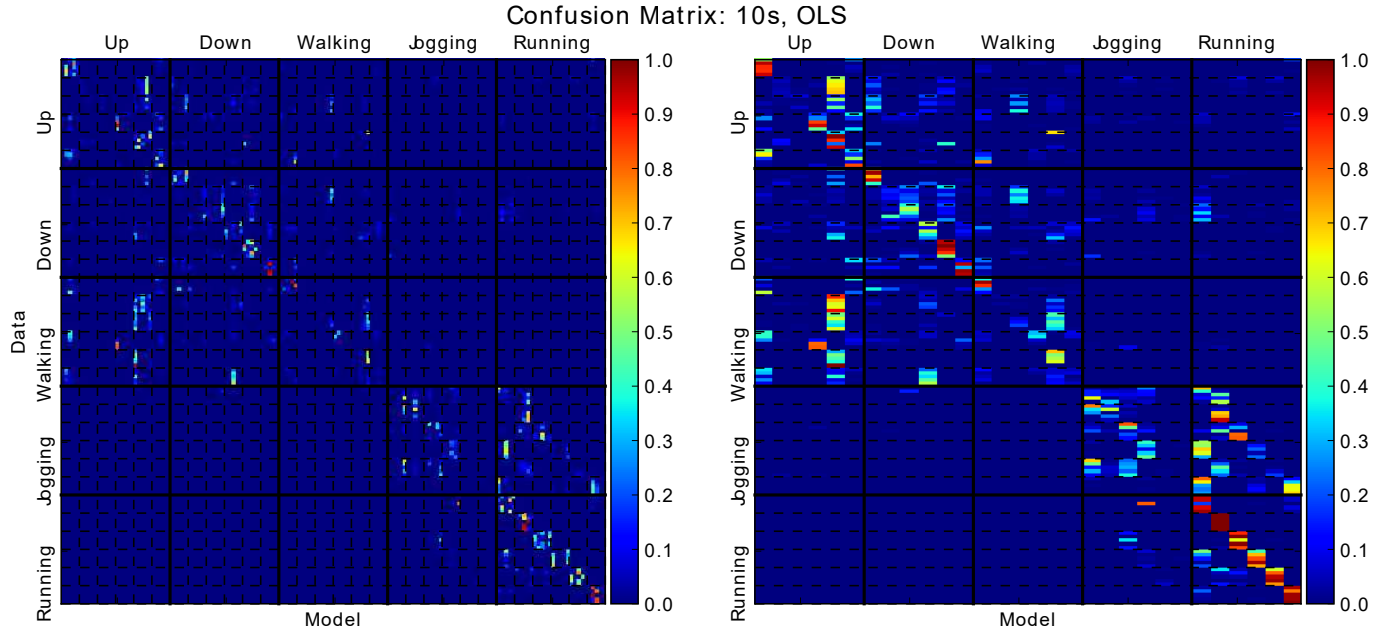


Fig. 14: Classification confusion matrix for linear models obtained with OLS regression and fit to 10s of data.

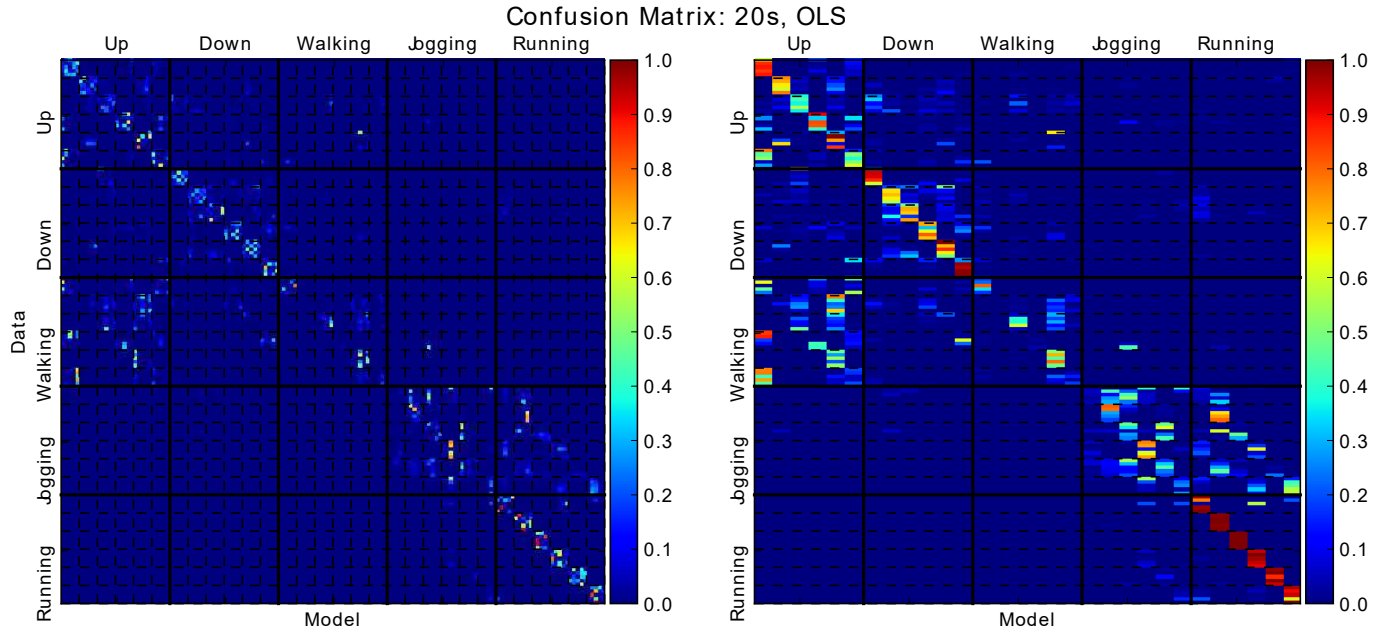


Fig. 15: Classification confusion matrix for linear models obtained with OLS regression and fit to 20s of data.

TABLE X: Classification accuracy and 95% confidence interval when the classifier was built with OLS given 20s of data and was given 5s of data to classify. Overall accuracy was 54.7%, task accuracy was 71.3% (walking like was 97.9% and running like was 99.6%), and subject accuracy was 65.5%.

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Identify Subject
Up	0.816 ± 0.1	0.704 ± 0.061	0.424 ± 0.064	0.66 ± 0.211	0.596 ± 0.302	0.436 ± 0.137	0.831 ± 0.071
Down	0.72 ± 0.22	0.56 ± 0.166	0.564 ± 0.19	0.638 ± 0.148	0.744 ± 0.155	0.834 ± 0.252	0.85 ± 0.058
Walking	0.348 ± 0.21	$0.0 \pm \text{nan}$	0.302 ± 0.187	0.012 ± 0.014	0.59 ± 0.121	0.078 ± 0.064	0.309 ± 0.092
Jogging	0.038 ± 0.012	0.466 ± 0.241	0.282 ± 0.127	0.6 ± 0.211	0.276 ± 0.09	0.178 ± 0.084	0.61 ± 0.097
Running	0.752 ± 0.324	0.996 ± 0.004	$1.0 \pm \text{nan}$	0.952 ± 0.027	0.956 ± 0.044	0.88 ± 0.122	0.964 ± 0.028
Identify Subject	0.605 ± 0.229	0.652 ± 0.299	0.603 ± 0.177	0.669 ± 0.237	0.773 ± 0.212	0.629 ± 0.236	

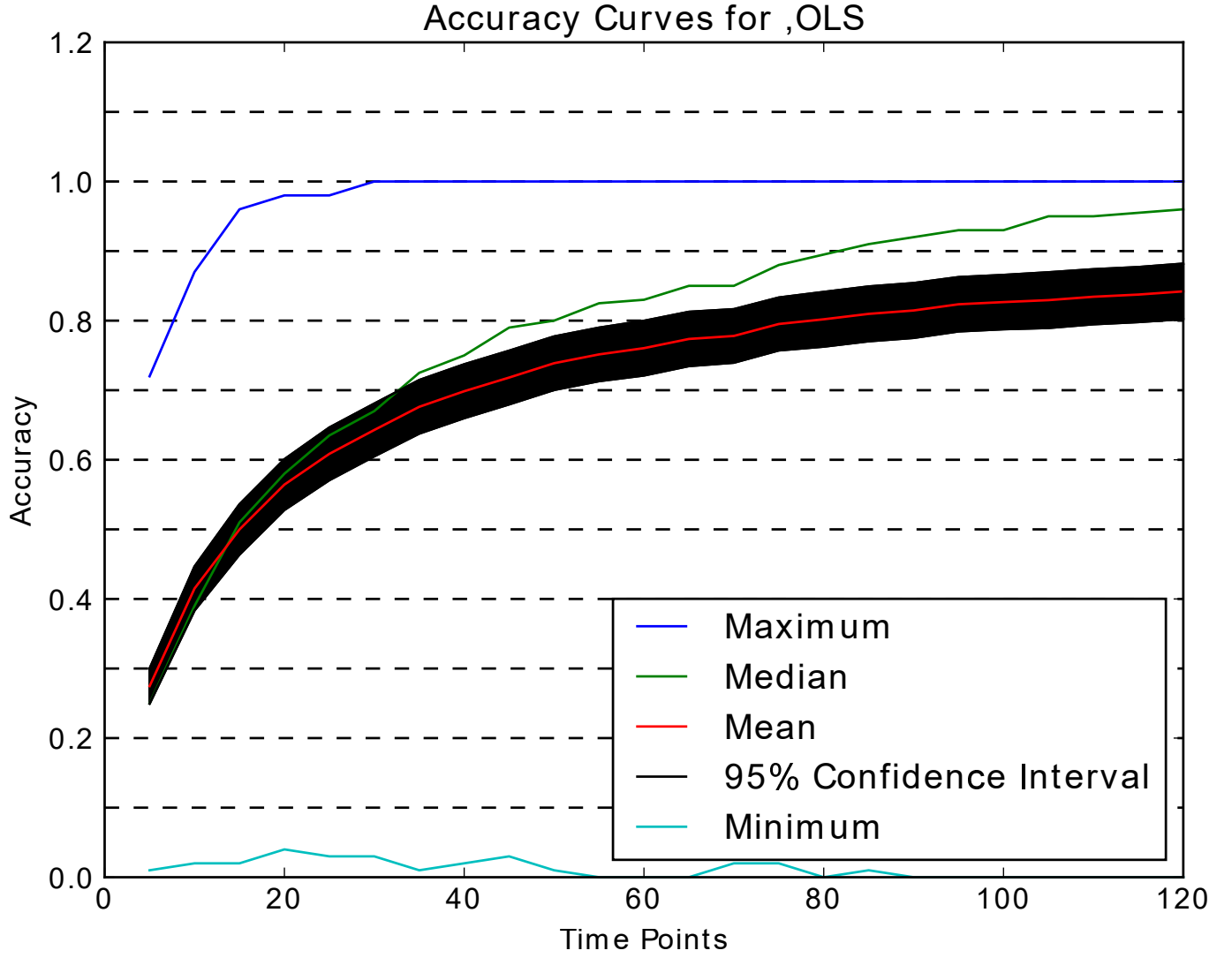


Fig. 16: Accuracy curve for OLS models. Accuracy increases as more data points are provided to the classifier before it is required to make a classification.

TABLE XI: Mean/Median fitness (p-value from single model classifier). Top ensemble fit to all data.

Time points/Voters	1	2	3	4	5	6	7	8	9	10
5	50.381/0.41 (0.5)	0.444/0.46 (0.002)	0.444/0.45 (0.003)	0.464/0.475 (0.0)	0.462/0.495 (0.0)	0.468/0.49 (0.0)	0.462/0.485 (0.0)	0.471/0.485 (0.0)	0.466/0.47 (0.0)	0.474/0.49 (0.0)
10	0.564/0.64 (0.5)	0.616/0.695 (0.012)	0.615/0.66 (0.022)	0.628/0.675 (0.005)	0.627/0.67 (0.008)	0.640/0.68 (0.001)	0.631/0.685 (0.003)	0.632/0.695 (0.002)	0.642/0.69 (0.001)	0.640/0.68 (0.001)
15	0.654/0.735 (0.5)	0.693/0.765 (0.045)	0.695/0.765 (0.029)	0.709/0.78 (0.009)	0.705/0.775 (0.01)	0.721/0.785 (0.003)	0.711/0.765 (0.009)	0.715/0.76 (0.004)	0.717/0.785 (0.003)	0.719/0.78 (0.003)
20	0.71/0.81 (0.5)	0.746/0.845 (0.051)	0.746/0.82 (0.052)	0.760/0.85 (0.01)	0.755/0.84 (0.013)	0.767/0.86 (0.006)	0.765/0.86 (0.004)	0.762/0.855 (0.007)	0.766/0.85 (0.003)	0.768/0.85 (0.005)
25	0.742/0.85 (0.5)	0.782/0.895 (0.026)	0.782/0.87 (0.032)	0.796/0.9 (0.005)	0.790/0.89 (0.009)	0.794/0.905 (0.006)	0.795/0.89 (0.01)	0.805/0.895 (0.001)	0.798/0.885 (0.003)	0.804/0.905 (0.001)
30	0.772/0.87 (0.5)	0.801/0.9 (0.064)	0.807/0.905 (0.028)	0.815/0.915 (0.011)	0.812/0.92 (0.02)	0.817/0.925 (0.011)	0.818/0.925 (0.008)	0.825/0.92 (0.003)	0.823/0.925 (0.003)	0.823/0.925 (0.004)
35	0.793/0.9 (0.5)	0.820/0.93 (0.098)	0.823/0.935 (0.116)	0.831/0.94 (0.044)	0.834/0.935 (0.042)	0.840/0.945 (0.028)	0.839/0.95 (0.033)	0.842/0.96 (0.016)	0.840/0.94 (0.023)	0.844/0.955 (0.011)
40	0.81/0.915 (0.5)	0.834/0.95 (0.07)	0.838/0.95 (0.092)	0.848/0.96 (0.024)	0.850/0.96 (0.03)	0.853/0.96 (0.012)	0.850/0.955 (0.016)	0.853/0.96 (0.011)	0.853/0.96 (0.008)	0.856/0.965 (0.006)
45	0.823/0.94 (0.5)	0.848/0.965 (0.044)	0.845/0.96 (0.068)	0.859/0.97 (0.015)	0.860/0.965 (0.028)	0.863/0.98 (0.007)	0.863/0.97 (0.008)	0.864/0.97 (0.009)	0.863/0.97 (0.01)	0.866/0.975 (0.005)
50	0.831/0.95 (0.5)	0.860/0.975 (0.069)	0.859/0.96 (0.081)	0.865/0.98 (0.038)	0.867/0.97 (0.075)	0.871/0.975 (0.027)	0.871/0.98 (0.043)	0.871/0.98 (0.013)	0.874/0.98 (0.022)	0.874/0.99 (0.009)
55	0.843/0.96 (0.5)	0.867/0.98 (0.162)	0.868/0.98 (0.082)	0.873/0.98 (0.042)	0.876/0.985 (0.048)	0.879/0.98 (0.089)	0.881/0.99 (0.032)	0.881/0.98 (0.026)	0.882/0.99 (0.021)	0.881/0.99 (0.032)
60	0.848/0.97 (0.5)	0.875/0.99 (0.043)	0.871/0.98 (0.072)	0.879/0.985 (0.032)	0.881/0.99 (0.035)	0.887/0.99 (0.01)	0.884/0.99 (0.014)	0.884/0.99 (0.016)	0.885/0.99 (0.018)	0.889/0.99 (0.01)
65	0.860/0.975 (0.5)	0.881/0.99 (0.077)	0.878/0.99 (0.102)	0.887/0.99 (0.055)	0.888/0.99 (0.072)	0.890/99 (0.042)	0.894/0.99 (0.041)	0.890/99 (0.033)	0.891/0.99 (0.025)	0.892/0.99 (0.057)
70	0.865/0.98 (0.5)	0.884/0.99 (0.084)	0.882/0.99 (0.156)	0.891/0 (0.028)	0.891/0.99 (0.057)	0.899/0.99 (0.063)	0.897/1.0 (0.034)	0.898/1.0 (0.022)	0.894/0.99 (0.044)	0.898/0.99 (0.035)
75	0.869/0.98 (0.5)	0.884/0.99 (0.094)	0.890/0.995 (0.067)	0.897/0.99 (0.048)	0.898/0.99 (0.054)	0.901/1.0 (0.029)	0.901/1.0 (0.022)	0.902/1.0 (0.018)	0.899/1.0 (0.026)	0.903/1.0 (0.009)
80	0.875/0.99 (0.5)	0.891/0 (0.119)	0.888/1.0 (0.136)	0.899/1.0 (0.047)	0.91/1.0 (0.075)	0.906/1.0 (0.029)	0.908/1.0 (0.038)	0.905/1.0 (0.025)	0.903/1.0 (0.047)	0.908/1.0 (0.037)
85	0.881/0.99 (0.5)	0.893/1.0 (0.113)	0.893/1.0 (0.164)	0.901/1.0 (0.054)	0.904/0.99 (0.202)	0.91/1.0 (0.066)	0.907/1.0 (0.101)	0.904/1.0 (0.145)	0.904/1.0 (0.102)	0.909/1.0 (0.064)
90	0.882/0.99 (0.5)	0.896/1.0 (0.171)	0.897/0.995 (0.177)	0.908/1.0 (0.031)	0.909/1.0 (0.061)	0.911/1.0 (0.017)	0.908/1.0 (0.025)	0.911/1.0 (0.02)	0.905/1.0 (0.071)	0.911/1.0 (0.019)
95	0.880/0.995 (0.5)	0.901/1.0 (0.095)	0.897/1.0 (0.078)	0.907/1.0 (0.112)	0.909/1.0 (0.17)	0.912/1.0 (0.06)	0.915/1.0 (0.086)	0.911/1.0 (0.035)	0.913/1.0 (0.116)	0.914/1.0 (0.063)
100	0.887/1.0 (0.5)	0.905/1.0 (0.101)	0.91/1.0 (0.239)	0.91/1.0 (0.035)	0.914/1.0 (0.144)	0.915/1.0 (0.083)	0.917/1.0 (0.094)	0.915/1.0 (0.043)	0.917/1.0 (0.069)	0.915/1.0 (0.115)
105	0.893/1.0 (0.5)	0.905/1.0 (0.21)	0.901/1.0 (0.126)	0.914/1.0 (0.058)	0.917/1.0 (0.079)	0.917/1.0 (0.05)	0.923/1.0 (0.035)	0.915/1.0 (0.037)	0.916/1.0 (0.11)	0.922/1.0 (0.029)
110	0.894/1.0 (0.5)	0.908/1.0 (0.357)	0.907/1.0 (0.329)	0.912/1.0 (0.12)	0.915/1.0 (0.183)	0.917/1.0 (0.155)	0.922/1.0 (0.161)	0.919/1.0 (0.193)	0.919/1.0 (0.161)	0.926/1.0 (0.055)
115	0.895/1.0 (0.5)	0.908/1.0 (0.135)	0.905/1.0 (0.186)	0.915/1.0 (0.088)	0.921/1.0 (0.066)	0.921/1.0 (0.035)	0.923/1.0 (0.045)	0.919/1.0 (0.066)	0.919/1.0 (0.046)	0.924/1.0 (0.024)
120	0.91/1.0 (0.5)	0.911/1.0 (0.256)	0.909/1.0 (0.329)	0.914/1.0 (0.087)	0.921/1.0 (0.113)	0.923/1.0 (0.035)	0.924/1.0 (0.084)	0.923/1.0 (0.056)	0.924/1.0 (0.099)	0.924/1.0 (0.059)

TABLE XII: Mean/Median fitness (p-value from single model classifier). Top ensemble fit to 10s of data.

Time points/Voters	1	2	3	4	5	6	7	8	9	10
5	0.224/0.195 (0.5)	0.269/0.225 (0.077)	0.274/0.225 (0.075)	0.291/0.25 (0.02)	0.284/0.24 (0.029)	0.301/0.275 (0.006)	0.289/0.27 (0.018)	0.30/0.27 (0.006)	0.295/0.27 (0.017)	0.296/0.275 (0.01)
10	0.326/0.305 (0.5)	0.367/0.34 (0.16)	0.368/0.305 (0.134)	0.382/0.365 (0.114)	0.390/0.395 (0.051)	0.393/0.37 (0.037)	0.392/0.385 (0.044)	0.399/0.39 (0.027)	0.394/0.41 (0.037)	0.40/0.395 (0.039)
15	0.376/0.355 (0.5)	0.402/0.385 (0.377)	0.415/0.33 (0.188)	0.430/0.39 (0.117)	0.434/0.435 (0.081)	0.441/0.465 (0.056)	0.447/0.44 (0.035)	0.452/0.49 (0.034)	0.442/0.455 (0.056)	0.445/0.43 (0.05)
20	0.397/0.375 (0.5)	0.427/0.41 (0.293)	0.443/0.365 (0.119)	0.460/0.46 (0.06)	0.462/0.485 (0.052)	0.474/0.485 (0.025)	0.471/0.475 (0.027)	0.474/0.505 (0.027)	0.478/0.515 (0.021)	0.479/0.515 (0.019)
25	0.42/0.42 (0.5)	0.449/0.41 (0.271)	0.465/0.375 (0.104)	0.483/0.46 (0.063)	0.479/0.54 (0.065)	0.489/0.49 (0.035)	0.491/0.48 (0.033)	0.495/0.55 (0.035)	0.494/0.515 (0.029)	0.496/0.555 (0.03)
30	0.437/0.42 (0.5)	0.463/0.45 (0.287)	0.476/0.395 (0.134)	0.497/0.48 (0.076)	0.491/0.52 (0.086)	0.508/0.54 (0.035)	0.50/0.51 (0.046)	0.509/0.585 (0.029)	0.501/0.545 (0.051)	0.512/0.56 (0.028)
35	0.452/0.395 (0.5)	0.475/0.44 (0.275)	0.486/0.385 (0.154)	0.507/0.52 (0.075)	0.505/0.555 (0.084)	0.516/0.57 (0.045)	0.515/0.56 (0.043)	0.517/0.6 (0.044)	0.519/0.635 (0.034)	0.513/0.63 (0.055)
40	0.459/0.455 (0.5)	0.488/0.45 (0.275)	0.502/0.41 (0.1)	0.509/0.54 (0.102)	0.51/0.55 (0.078)	0.521/0.615 (0.044)	0.52/0.57 (0.047)	0.524/0.65 (0.039)	0.523/0.655 (0.043)	0.520/575 (0.042)
45	0.466/0.45 (0.5)	0.488/0.46 (0.247)	0.505/0.43 (0.106)	0.512/0.58 (0.122)	0.512/0.58 (0.11)	0.523/0.61 (0.058)	0.525/0.6 (0.047)	0.528/0.61 (0.033)	0.525/0.61 (0.044)	0.526/0.595 (0.043)
50	0.473/0.44 (0.5)	0.492/0.465 (0.261)	0.501/0.415 (0.172)	0.527/0.595 (0.07)	0.521/0.6 (0.112)	0.525/0.645 (0.09)	0.528/0.62 (0.06)	0.536/0.62 (0.046)	0.535/0.655 (0.051)	0.534/0.65 (0.052)
55	0.477/0.48 (0.5)	0.494/0.5 (0.251)	0.509/0.44 (0.146)	0.532/0.62 (0.055)	0.525/0.63 (0.093)	0.533/0.685 (0.055)	0.532/0.625 (0.065)	0.530/0.655 (0.063)	0.536/0.69 (0.038)	0.536/0.575 (0.036)
60	0.484/0.48 (0.5)	0.497/0.5 (0.328)	0.507/0.43 (0.184)	0.526/0.625 (0.132)	0.528/0.6 (0.125)	0.535/0.67 (0.074)	0.535/0.63 (0.062)	0.538/0.685 (0.064)	0.535/0.685 (0.061)	0.538/0.665 (0.06)
65	0.489/0.5 (0.5)	0.503/0.525 (0.231)	0.521/0.46 (0.12)	0.534/0.62 (0.086)	0.528/0.595 (0.116)	0.539/0.69 (0.052)	0.537/0.63 (0.06)	0.537/0.705 (0.057)	0.537/0.69 (0.057)	0.534/0.635 (0.069)
70	0.492/0.525 (0.5)	0.50/0.465 (0.25)	0.515/0.465 (0.125)	0.533/0.66 (0.073)	0.531/0.605 (0.091)	0.534/0.7 (0.061)	0.539/0.67 (0.043)	0.539/0.71 (0.032)	0.537/0.67 (0.048)	0.539/0.64 (0.037)
75	0.497/0.515 (0.5)	0.503/0.495 (0.291)	0.524/0.48 (0.153)	0.536/0.675 (0.086)	0.532/0.61 (0.094)	0.541/0.7 (0.061)	0.538/0.64 (0.075)	0.540/0.74 (0.067)	0.535/0.67 (0.084)	0.539/0.675 (0.057)
80	0.501/0.49 (0.5)	0.508/0.495 (0.261)	0.527/0.49 (0.131)	0.538/0.675 (0.101)	0.533/0.675 (0.139)	0.540/0.695 (0.087)	0.538/0.645 (0.084)	0.538/0.675 (0.084)	0.540/0.67 (0.07)	0.537/0.63 (0.087)
85	0.50/49 (0.5)	0.508/0.54 (0.242)	0.520/485 (0.154)	0.538/0.695 (0.075)	0.532/0.605 (0.11)	0.539/0.7 (0.072)	0.540/0.665 (0.066)	0.540/0.72 (0.039)	0.540/0.685 (0.052)	0.539/0.66 (0.062)
90	0.50/525 (0.5)	0.509/0.5 (0.244)	0.525/0.53 (0.102)	0.536/0.71 (0.103)	0.533/0.64 (0.094)	0.541/0.715 (0.07)	0.540/0.615 (0.05)	0.540/0.71 (0.051)	0.539/0.675 (0.048)	0.541/0.66 (0.052)
95	0.503/0.495 (0.5)	0.507/0.525 (0.352)	0.525/0.515 (0.139)	0.541/0.7 (0.111)	0.535/0.675 (0.141)	0.541/0.725 (0.106)	0.543/0.645 (0.09)	0.545/0.76 (0.081)	0.541/0.725 (0.092)	0.543/0.64 (0.088)
100	0.507/0.52 (0.5)	0.51/0.53 (0.287)	0.527/0.515 (0.168)	0.541/0.71 (0.139)	0.535/0.645 (0.115)	0.544/0.735 (0.094)	0.540/0.66 (0.099)	0.543/0.775 (0.092)	0.539/0.735 (0.104)	0.537/0.65 (0.089)
105	0.509/0.565 (0.5)	0.509/0.52 (0.288)	0.526/0.51 (0.142)	0.539/0.695 (0.069)	0.537/0.66 (0.095)	0.544/0.7 (0.056)	0.543/0.71 (0.049)	0.543/0.76 (0.05)	0.541/0.715 (0.064)	0.542/0.685 (0.06)
110	0.507/0.55 (0.5)	0.511/0.545 (0.332)	0.526/0.495 (0.151)	0.538/0.715 (0.081)	0.536/0.625 (0.105)	0.543/0.76 (0.08)	0.545/0.7 (0.069)	0.542/0.77 (0.062)	0.541/0.685 (0.076)	0.539/0.635 (0.091)
115	0.509/0.495 (0.5)	0.51/0.5 (0.195)	0.530/57 (0.133)	0.540/765 (0.048)	0.534/0.6 (0.082)	0.543/0.735 (0.065)	0.539/0.665 (0.072)	0.540/0.745 (0.055)	0.542/0.695 (0.064)	0.539/0.67 (0.088)
120	0.511/0.53 (0.5)	0.513/0.575 (0.342)	0.531/0.59 (0.145)	0.544/0.745 (0.098)	0.534/0.64 (0.129)	0.545/0.74 (0.107)	0.544/0.695 (0.089)	0.542/0.735 (0.076)	0.542/0.725 (0.067)	0.543/0.67 (0.088)

TABLE XIII: Mean/Median fitness (p-value from single model classifier). Top ensemble fit to 20s of data.

Time points/Voters	1	2	3	4	5	6	7	8	9	10
5	0.268/0.23 (0.5)	0.31/0.265 (0.03)	0.304/0.26 (0.066)	0.326/0.29 (0.008)	0.321/0.3 (0.023)	0.324/0.29 (0.023)	0.323/0.3 (0.02)	0.325/0.295 (0.016)	0.323/0.31 (0.013)	0.322/0.29 (0.022)
10	0.385/0.345 (0.5)	0.436/0.39 (0.055)	0.435/0.43 (0.048)	0.44/0.44 (0.046)	0.442/0.44 (0.038)	0.450/0.45 (0.029)	0.444/0.44 (0.034)	0.443/0.445 (0.039)	0.440/455 (0.04)	0.448/0.465 (0.026)
15	0.449/0.445 (0.5)	0.496/0.47 (0.076)	0.495/0.51 (0.062)	0.51/0.545 (0.033)	0.507/0.535 (0.036)	0.512/0.515 (0.026)	0.514/0.53 (0.023)	0.516/0.555 (0.023)	0.503/0.54 (0.049)	0.508/0.555 (0.038)
20	0.492/0.5 (0.5)	0.534/0.53 (0.082)	0.536/0.535 (0.078)	0.548/0.565 (0.036)	0.548/0.59 (0.038)	0.553/0.57 (0.029)	0.549/0.545 (0.032)	0.556/0.57 (0.02)	0.547/0.575 (0.038)	0.547/0.58 (0.045)
25	0.529/0.58 (0.5)	0.566/0.58 (0.107)	0.564/0.575 (0.114)	0.571/0.575 (0.062)	0.582/0.595 (0.042)	0.582/0.61 (0.048)	0.585/0.6 (0.036)	0.585/0.615 (0.031)	0.577/0.595 (0.063)	0.582/0.605 (0.046)
30	0.556/0.565 (0.5)	0.583/0.59 (0.146)	0.588/0.61 (0.111)	0.595/0.675 (0.07)	0.597/0.64 (0.067)	0.602/0.61 (0.044)	0.604/0.645 (0.046)	0.604/0.65 (0.036)	0.594/0.66 (0.084)	0.601/0.665 (0.057)
35	0.57/0.595 (0.5)	0.601/0.63 (0.1)	0.604/0.635 (0.088)	0.603/0.65 (0.085)	0.615/0.655 (0.049)	0.618/0.66 (0.034)	0.617/0.67 (0.042)	0.619/0.705 (0.04)	0.611/0.63 (0.049)	0.617/0.695 (0.038)
40	0.589/0.62 (0.5)	0.613/0.64 (0.142)	0.61/0.67 (0.175)	0.617/0.7 (0.102)	0.629/0.68 (0.059)	0.630/0.705 (0.05)	0.628/0.685 (0.08)	0.634/0.7 (0.047)	0.624/0.7 (0.091)	0.627/0.7 (0.072)
45	0.602/0.675 (0.5)	0.62/0.68 (0.137)	0.624/0.695 (0.108)	0.628/0.71 (0.07)	0.635/0.685 (0.067)	0.638/0.71 (0.046)	0.640/0.755 (0.051)	0.641/0.7 (0.044)	0.633/0.71 (0.072)	0.636/0.73 (0.062)
50	0.612/0.695 (0.5)	0.625/0.705 (0.227)	0.629/0.745 (0.19)	0.639/0.77 (0.095)	0.643/0.71 (0.087)	0.650/0.74 (0.063)	0.645/0.73 (0.084)	0.644/0.71 (0.096)	0.639/0.78 (0.112)	0.640/745 (0.104)
55	0.618/0.675 (0.5)	0.633/0.71 (0.205)	0.637/0.73 (0.145)	0.646/0.76 (0.078)	0.647/0.725 (0.088)	0.652/0.74 (0.059)	0.650/0.74 (0.074)	0.657/0.785 (0.052)	0.640/755 (0.13)	0.651/0.75 (0.089)
60	0.628/0.685 (0.5)	0.648/0.755 (0.171)	0.636/0.725 (0.222)	0.651/0.765 (0.086)	0.660/0.75 (0.079)	0.657/0.755 (0.069)	0.664/0.77 (0.066)	0.659/0.8 (0.08)	0.651/0.755 (0.124)	0.654/0.765 (0.094)
65	0.63/0.71 (0.5)	0.644/0.77 (0.144)	0.647/0.765 (0.125)	0.655/0.765 (0.065)	0.656/0.76 (0.093)	0.662/0.8 (0.052)	0.669/0.785 (0.046)	0.664/0.8 (0.05)	0.656/0.805 (0.097)	0.659/0.79 (0.07)
70	0.639/0.705 (0.5)	0.644/0.76 (0.309)	0.651/0.805 (0.217)	0.66/0.8 (0.153)	0.662/0.78 (0.164)	0.666/0.81 (0.133)	0.663/0.79 (0.162)	0.668/0.805 (0.117)	0.657/0.82 (0.191)	0.663/0.8 (0.136)
75	0.643/0.745 (0.5)	0.655/0.795 (0.178)	0.660/805 (0.114)	0.662/0.835 (0.091)	0.665/0.79 (0.103)	0.673/0.835 (0.072)	0.673/0.805 (0.068)	0.671/0.82 (0.068)	0.664/0.835 (0.104)	0.669/0.835 (0.075)
80	0.649/0.755 (0.5)	0.657/0.82 (0.203)	0.655/0.83 (0.19)	0.67/0.82 (0.075)	0.671/0.81 (0.119)	0.67/0.815 (0.102)	0.676/0.855 (0.1)	0.67/0.84 (0.096)	0.665/0.845 (0.12)	0.668/0.82 (0.125)
85	0.652/0.75 (0.5)	0.661/0.82 (0.215)	0.661/0.85 (0.187)	0.67/0.85 (0.127)	0.671/0.825 (0.123)	0.671/0.82 (0.116)	0.678/0.85 (0.094)	0.675/0.865 (0.087)	0.666/0.845 (0.153)	0.67/0.865 (0.124)
90	0.655/0.755 (0.5)	0.664/0.825 (0.215)	0.665/0.85 (0.181)	0.666/0.835 (0.135)	0.676/0.82 (0.123)	0.678/0.85 (0.09)	0.678/0.86 (0.124)	0.674/0.85 (0.139)	0.672/0.85 (0.135)	0.673/0.84 (0.096)
95	0.659/0.805 (0.5)	0.663/0.825 (0.201)	0.662/0.875 (0.196)	0.674/0.875 (0.105)	0.679/0.825 (0.107)	0.679/0.885 (0.075)	0.686/0.875 (0.1)	0.683/0.87 (0.078)	0.668/0.895 (0.151)	0.675/0.865 (0.124)
100	0.657/0.82 (0.5)	0.669/0.84 (0.175)	0.67/0.87 (0.094)	0.67/0.85 (0.104)	0.676/0.85 (0.111)	0.678/0.86 (0.078)	0.686/0.87 (0.087)	0.682/0.86 (0.073)	0.673/0.88 (0.114)	0.677/0.875 (0.108)
105	0.67/0.8 (0.5)	0.671/0.86 (0.265)	0.672/0.9 (0.237)	0.678/0.865 (0.148)	0.679/0.845 (0.172)	0.684/0.875 (0.124)	0.687/0.9 (0.111)	0.682/0.88 (0.146)	0.675/0.88 (0.198)	0.681/0.87 (0.133)
110	0.671/0.82 (0.5)	0.676/0.87 (0.242)	0.668/0.87 (0.212)	0.678/0.895 (0.123)	0.682/0.86 (0.135)	0.684/0.89 (0.108)	0.685/0.885 (0.158)	0.687/0.91 (0.125)	0.67/0.89 (0.254)	0.68/0.905 (0.15)
115	0.671/0.815 (0.5)	0.673/0.875 (0.205)	0.673/0.92 (0.166)	0.677/0.885 (0.103)	0.685/0.87 (0.124)	0.682/0.86 (0.118)	0.684/0.87 (0.124)	0.685/0.885 (0.116)	0.676/0.9 (0.186)	0.683/0.9 (0.151)
120	0.671/0.815 (0.5)	0.672/0.9 (0.244)	0.673/0.92 (0.143)	0.681/0.875 (0.131)	0.687/0.865 (0.138)	0.686/0.905 (0.119)	0.694/0.9 (0.101)	0.688/0.91 (0.139)	0.681/0.91 (0.147)	0.683/0.9 (0.15)

TABLE XIV: Mean/Median fitness (p-value from single model classifier). Random ensemble fit to all data.

Time points/Voters	1	2	3	4	5	6	7	8	9	10
5	0.346/0.335 (0.5)	0.41/0.4 (0.002)	0.411/0.42 (0.002)	0.431/0.44 (0.0)	0.433/0.42 (0.0)	0.442/0.455 (0.0)	0.447/0.465 (0.0)	0.457/0.455 (0.0)	0.452/0.455 (0.0)	0.455/0.44 (0.0)
10	0.511/0.525 (0.5)	0.572/0.585 (0.007)	0.579/0.61 (0.003)	0.607/0.63 (0.0)	0.602/0.615 (0.0)	0.616/0.655 (0.0)	0.611/0.635 (0.0)	0.618/0.655 (0.0)	0.619/0.645 (0.0)	0.625/0.65 (0.0)
15	0.596/0.615 (0.5)	0.66/0.695 (0.004)	0.666/0.69 (0.002)	0.684/0.73 (0.0)	0.689/0.74 (0.0)	0.692/0.755 (0.0)	0.697/0.76 (0.0)	0.707/0.77 (0.0)	0.702/0.77 (0.0)	0.707/0.75 (0.0)
20	0.659/0.685 (0.5)	0.717/0.785 (0.004)	0.723/0.79 (0.003)	0.743/0.82 (0.0)	0.743/0.79 (0.0)	0.744/0.81 (0.0)	0.75/0.815 (0.0)	0.754/0.82 (0.0)	0.756/0.83 (0.0)	0.761/0.83 (0.0)
25	0.696/0.76 (0.5)	0.753/0.815 (0.003)	0.751/0.84 (0.003)	0.774/0.85 (0.0)	0.777/0.855 (0.0)	0.786/0.87 (0.0)	0.782/0.865 (0.0)	0.787/0.865 (0.0)	0.788/0.88 (0.0)	0.798/0.875 (0.0)
30	0.725/0.91 (0.5)	0.781/0.86 (0.003)	0.781/0.865 (0.002)	0.805/0.89 (0.0)	0.80/91 (0.0)	0.814/0.9 (0.0)	0.807/0.9 (0.0)	0.818/0.92 (0.0)	0.817/0.9 (0.0)	0.818/0.91 (0.0)

TABLE XV: Mean/Median fitness (p-value from single model classifier). Random ensemble fit to 10s of data.

Time points/Voters	1	2	3	4	5	6	7	8	9	10
5	0.174/0.14 (0.5)	0.22/0.19 (0.014)	0.219/0.19 (0.022)	0.239/0.2 (0.005)	0.237/0.22 (0.004)	0.247/0.205 (0.002)	0.248/0.225 (0.001)	0.255/0.22 (0.002)	0.253/0.22 (0.002)	0.258/0.23 (0.001)
10	0.243/0.21 (0.5)	0.3/0.25 (0.031)	0.297/0.25 (0.021)	0.324/0.27 (0.008)	0.318/0.265 (0.009)	0.331/0.295 (0.006)	0.335/0.275 (0.002)	0.345/0.32 (0.001)	0.344/0.305 (0.002)	0.342/0.29 (0.003)
15	0.284/0.27 (0.5)	0.34/0.27 (0.039)	0.335/0.295 (0.092)	0.368/0.32 (0.009)	0.371/0.315 (0.008)	0.381/0.325 (0.006)	0.372/0.32 (0.012)	0.386/0.34 (0.007)	0.388/0.34 (0.004)	0.394/0.325 (0.005)
20	0.311/0.27 (0.5)	0.373/0.32 (0.031)	0.368/0.32 (0.045)	0.389/0.34 (0.026)	0.393/0.33 (0.015)	0.403/0.36 (0.013)	0.405/0.375 (0.011)	0.413/0.37 (0.011)	0.413/0.37 (0.008)	0.409/0.38 (0.017)
25	0.335/0.29 (0.5)	0.383/0.32 (0.097)	0.392/0.33 (0.052)	0.41/0.365 (0.026)	0.401/0.36 (0.041)	0.424/0.385 (0.023)	0.423/0.385 (0.02)	0.436/0.405 (0.008)	0.431/0.4 (0.015)	0.439/0.405 (0.011)
30	0.342/0.285 (0.5)	0.401/0.385 (0.046)	0.398/0.355 (0.058)	0.427/0.39 (0.012)	0.425/0.39 (0.022)	0.441/0.405 (0.01)	0.433/0.4 (0.019)	0.446/0.405 (0.01)	0.443/0.415 (0.015)	0.454/0.41 (0.007)
35	0.362/0.315 (0.5)	0.414/0.355 (0.063)	0.41/0.38 (0.118)	0.437/0.405 (0.04)	0.433/0.39 (0.043)	0.447/0.405 (0.025)	0.447/0.43 (0.026)	0.459/0.455 (0.016)	0.455/0.425 (0.023)	0.465/0.435 (0.017)
40	0.366/0.335 (0.5)	0.417/0.37 (0.074)	0.42/0.36 (0.063)	0.439/0.405 (0.039)	0.439/0.405 (0.037)	0.457/0.44 (0.019)	0.457/0.425 (0.022)	0.461/0.435 (0.025)	0.464/0.46 (0.016)	0.473/0.45 (0.012)
45	0.37/0.32 (0.5)	0.423/0.375 (0.073)	0.434/0.41 (0.047)	0.452/0.435 (0.031)	0.455/0.42 (0.025)	0.466/0.435 (0.015)	0.461/0.425 (0.027)	0.466/0.45 (0.025)	0.471/0.43 (0.02)	0.477/0.475 (0.017)
50	0.371/0.325 (0.5)	0.427/0.39 (0.076)	0.433/0.38 (0.047)	0.451/0.41 (0.03)	0.452/0.415 (0.025)	0.462/0.435 (0.022)	0.467/0.44 (0.015)	0.481/0.475 (0.007)	0.474/0.47 (0.016)	0.484/0.47 (0.009)
55	0.385/0.33 (0.5)	0.436/0.375 (0.099)	0.441/0.42 (0.069)	0.467/0.43 (0.027)	0.464/0.445 (0.029)	0.473/0.455 (0.021)	0.47/0.46 (0.032)	0.48/0.48 (0.026)	0.476/0.46 (0.029)	0.481/0.47 (0.028)
60	0.388/0.34 (0.5)	0.442/0.41 (0.072)	0.445/0.42 (0.088)	0.463/0.435 (0.038)	0.467/0.45 (0.036)	0.475/0.455 (0.026)	0.475/0.475 (0.028)	0.483/0.455 (0.02)	0.486/0.46 (0.016)	0.489/0.5 (0.018)
65	0.39/0.345 (0.5)	0.447/0.445 (0.077)	0.441/0.415 (0.102)	0.464/0.435 (0.046)	0.462/0.425 (0.053)	0.475/0.46 (0.034)	0.474/0.46 (0.037)	0.488/0.47 (0.022)	0.49/0.475 (0.016)	0.491/0.475 (0.023)
70	0.389/0.36 (0.5)	0.441/0.41 (0.118)	0.443/0.395 (0.099)	0.471/0.41 (0.026)	0.47/0.46 (0.028)	0.486/0.49 (0.019)	0.478/0.45 (0.029)	0.487/0.47 (0.021)	0.488/0.46 (0.022)	0.492/0.475 (0.019)
75	0.397/0.37 (0.5)	0.445/0.385 (0.113)	0.449/0.425 (0.093)	0.47/0.465 (0.048)	0.471/0.465 (0.048)	0.484/0.46 (0.026)	0.486/0.485 (0.024)	0.491/0.48 (0.023)	0.492/0.45 (0.022)	0.493/0.485 (0.026)
80	0.394/0.355 (0.5)	0.447/0.44 (0.08)	0.452/0.435 (0.069)	0.474/0.46 (0.03)	0.472/0.44 (0.033)	0.486/0.475 (0.022)	0.483/0.48 (0.023)	0.492/0.455 (0.02)	0.492/0.495 (0.017)	0.496/0.5 (0.019)
85	0.396/0.35 (0.5)	0.451/0.41 (0.083)	0.45/0.425 (0.065)	0.474/0.48 (0.037)	0.477/0.46 (0.032)	0.482/0.47 (0.037)	0.485/0.465 (0.027)	0.503/0.5 (0.015)	0.497/0.5 (0.023)	0.499/0.5 (0.023)
90	0.398/0.355 (0.5)	0.45/0.405 (0.084)	0.457/0.42 (0.071)	0.477/0.44 (0.034)	0.474/0.425 (0.041)	0.487/0.48 (0.027)	0.487/0.46 (0.028)	0.494/0.475 (0.027)	0.50/49 (0.015)	0.503/0.54 (0.018)
95	0.407/0.4 (0.5)	0.449/0.43 (0.144)	0.461/0.445 (0.07)	0.478/0.46 (0.05)	0.481/0.445 (0.039)	0.491/0.485 (0.034)	0.493/0.485 (0.021)	0.493/0.52 (0.037)	0.497/0.5 (0.026)	0.502/0.515 (0.027)
100	0.408/0.37 (0.5)	0.454/0.45 (0.115)	0.454/0.405 (0.138)	0.484/0.44 (0.038)	0.481/0.47 (0.051)	0.492/0.485 (0.03)	0.493/0.47 (0.027)	0.501/0.495 (0.022)	0.501/0.51 (0.028)	0.506/0.5 (0.022)
105	0.409/0.39 (0.5)	0.451/0.42 (0.162)	0.454/0.42 (0.13)	0.479/0.455 (0.053)	0.474/0.44 (0.078)	0.498/0.51 (0.026)	0.49/0.48 (0.041)	0.497/0.485 (0.037)	0.492/0.495 (0.053)	0.506/0.5 (0.021)
110	0.408/0.385 (0.5)	0.454/0.415 (0.131)	0.463/0.46 (0.089)	0.483/0.45 (0.036)	0.479/0.45 (0.05)	0.491/0.465 (0.034)	0.494/0.48 (0.026)	0.501/0.525 (0.025)	0.502/0.5 (0.022)	0.504/0.48 (0.025)
115	0.411/0.375 (0.5)	0.455/0.43 (0.134)	0.461/0.455 (0.1)	0.481/0.45 (0.051)	0.476/0.45 (0.066)	0.496/0.495 (0.028)	0.497/0.495 (0.026)	0.501/0.505 (0.03)	0.505/0.495 (0.018)	0.505/0.535 (0.031)
120	0.403/0.4 (0.5)	0.458/0.41 (0.09)	0.463/0.43 (0.063)	0.483/0.47 (0.034)	0.477/0.46 (0.047)	0.492/0.47 (0.032)	0.496/0.5 (0.022)	0.504/0.5 (0.017)	0.499/0.485 (0.027)	0.503/0.5 (0.027)

TABLE XVI: Mean/Median fitness (p-value from single model classifier). Random ensemble fit to 20s of data.

Time points/Voters	1	2	3	4	5	6	7	8	9	10
5	0.192/0.165 (0.5)	0.24/0.21 (0.005)	0.236/0.2 (0.018)	0.258/0.225 (0.001)	0.255/0.23 (0.003)	0.279/0.24 (0)	0.268/0.23 (0.001)	0.277/0.245 (0)	0.275/0.24 (0)	0.281/0.255 (0)
10	0.281/0.25 (0.5)	0.341/0.335 (0.012)	0.346/0.305 (0.01)	0.363/0.35 (0.002)	0.365/0.365 (0.002)	0.377/0.37 (0.001)	0.38/0.38 (0.001)	0.383/0.37 (0.001)	0.378/0.37 (0.001)	0.388/0.38 (0)
15	0.338/0.32 (0.5)	0.394/0.38 (0.028)	0.393/0.365 (0.034)	0.428/0.43 (0.001)	0.415/0.42 (0.006)	0.434/0.42 (0.001)	0.434/0.435 (0.001)	0.444/0.4 (0)	0.439/0.415 (0.001)	0.448/0.43 (0)
20	0.361/0.355 (0.5)	0.43/0.415 (0.011)	0.431/0.415 (0.008)	0.456/0.47 (0.001)	0.459/0.485 (0.001)	0.476/0.45 (0)	0.473/0.46 (0)	0.479/0.435 (0)	0.492/0.49 (0)	0.49/0.485 (0)
25	0.387/0.38 (0.5)	0.46/0.435 (0.009)	0.453/0.465 (0.01)	0.483/0.445 (0.001)	0.485/0.465 (0.001)	0.497/0.5 (0)	0.501/0.505 (0)	0.511/0.49 (0)	0.507/0.51 (0)	0.524/0.52 (0)
30	0.403/0.385 (0.5)	0.483/0.48 (0.003)	0.478/0.45 (0.006)	0.51/0.505 (0)	0.508/0.49 (0)	0.526/0.53 (0)	0.522/0.52 (0)	0.531/0.51 (0)	0.531/0.51 (0)	0.541/0.545 (0)
35	0.413/0.405 (0.5)	0.496/0.5 (0.003)	0.492/0.495 (0.005)	0.519/0.5 (0)	0.517/0.51 (0)	0.537/0.555 (0)	0.539/0.535 (0)	0.544/0.55 (0)	0.548/0.54 (0)	0.558/0.585 (0)
40	0.43/0.41 (0.5)	0.511/0.52 (0.003)	0.509/0.51 (0.004)	0.531/0.56 (0.001)	0.535/0.545 (0)	0.551/0.565 (0)	0.551/0.565 (0)	0.566/0.6 (0)	0.563/0.565 (0)	0.57/0.59 (0)
45	0.445/0.44 (0.5)	0.51/0.5 (0.019)	0.518/0.535 (0.007)	0.543/0.52 (0.001)	0.541/0.555 (0.001)	0.56/0.59 (0)	0.566/0.595 (0)	0.572/0.6 (0)	0.571/0.61 (0)	0.577/0.615 (0)
50	0.452/0.45 (0.5)	0.522/0.54 (0.01)	0.526/0.535 (0.007)	0.558/0.58 (0)	0.557/0.61 (0)	0.573/0.62 (0)	0.572/0.605 (0)	0.576/0.61 (0)	0.576/0.62 (0)	0.593/0.64 (0)
55	0.454/0.465 (0.5)	0.533/0.57 (0.004)	0.53/0.565 (0.005)	0.559/0.61 (0)	0.562/0.59 (0)	0.578/0.6 (0)	0.579/0.61 (0)	0.59/0.64 (0)	0.588/0.645 (0)	0.599/0.655 (0)
60	0.459/0.47 (0.5)	0.537/0.56 (0.004)	0.537/0.58 (0.003)	0.57/0.61 (0)	0.57/0.615 (0)	0.584/0.63 (0)	0.584/0.645 (0)	0.591/0.62 (0)	0.593/0.65 (0)	0.603/0.67 (0)
65	0.472/0.48 (0.5)	0.534/0.565 (0.014)	0.545/0.565 (0.007)	0.57/0.63 (0.001)	0.57/0.6 (0)	0.588/0.67 (0)	0.59/0.64 (0)	0.596/0.64 (0)	0.597/0.65 (0)	0.608/0.68 (0)
70	0.475/0.47 (0.5)	0.551/0.57 (0.004)	0.548/0.57 (0.006)	0.579/0.645 (0)	0.579/0.635 (0)	0.598/0.67 (0)	0.599/0.66 (0)	0.603/0.66 (0)	0.609/0.71 (0)	0.613/0.695 (0)
75	0.474/0.485 (0.5)	0.551/0.59 (0.004)	0.553/0.58 (0.004)	0.582/0.63 (0)	0.583/0.64 (0)	0.60/0.69 (0)	0.61/0.675 (0)	0.612/0.67 (0)	0.612/0.67 (0)	0.616/0.685 (0)
80	0.477/0.49 (0.5)	0.554/0.565 (0.005)	0.554/0.59 (0.004)	0.585/0.645 (0)	0.581/0.64 (0)	0.603/0.67 (0)	0.6/0.695 (0)	0.617/0.7 (0)	0.615/0.685 (0)	0.62/0.7 (0)
85	0.484/0.48 (0.5)	0.561/0.605 (0.004)	0.562/0.61 (0.003)	0.587/0.64 (0)	0.588/0.67 (0)	0.607/0.69 (0)	0.604/0.675 (0)	0.622/0.71 (0)	0.615/0.695 (0)	0.623/0.715 (0)
90	0.487/0.48 (0.5)	0.563/0.61 (0.004)	0.564/0.635 (0.003)	0.591/0.665 (0)	0.593/0.67 (0)	0.613/0.685 (0)	0.606/0.69 (0)	0.62/0.715 (0)	0.622/0.71 (0)	0.63/0.735 (0)
95	0.488/0.51 (0.5)	0.563/0.605 (0.004)	0.563/0.62 (0.004)	0.595/0.665 (0)	0.592/0.645 (0)	0.61/0.685 (0)	0.616/0.69 (0)	0.621/0.72 (0)	0.628/0.73 (0)	0.635/0.74 (0)
100	0.49/0.495 (0.5)	0.569/0.62 (0.003)	0.565/0.615 (0.005)	0.6/0.665 (0)	0.6/0.695 (0)	0.615/0.695 (0)	0.616/0.7 (0)	0.625/0.74 (0)	0.618/0.71 (0)	0.635/0.735 (0)
105	0.489/0.49 (0.5)	0.569/0.62 (0.002)	0.568/0.63 (0.002)	0.602/0.68 (0)	0.604/0.69 (0)	0.616/0.7 (0)	0.614/0.68 (0)	0.629/0.735 (0)	0.629/0.745 (0)	0.64/0.74 (0)
110	0.49/0.51 (0.5)	0.576/0.64 (0.001)	0.574/0.6 (0.002)	0.601/0.665 (0)	0.601/0.67 (0)	0.623/0.73 (0)	0.616/0.7 (0)	0.635/0.73 (0)	0.626/0.735 (0)	0.637/0.765 (0)
115	0.495/0.495 (0.5)	0.571/0.645 (0.002)	0.571/0.625 (0.004)	0.607/0.69 (0)	0.601/0.68 (0)	0.618/0.71 (0)	0.623/0.71 (0)	0.635/0.75 (0)	0.630/0.745 (0)	0.638/0.76 (0)
120	0.496/0.525 (0.5)	0.574/0.64 (0.003)	0.576/0.62 (0.002)	0.604/0.69 (0)	0.6/0.68 (0)	0.622/0.725 (0)	0.62/0.72 (0)	0.635/0.77 (0)	0.628/0.73 (0)	0.644/0.775 (0)

TABLE XVII: Mean/Median fitness (p-value from single model classifier). Mixed ensemble fit to all data.

Time points/Voters	1	2	3	4	5	6	7	8	9	10
5	0.368/0.36 (0.5)	0.421/0.42 (0.01)	0.433/0.455 (0.001)	0.446/0.45 (0)	0.45/0.44 (0)	0.455/0.46 (0)	0.456/0.475 (0)	0.468/0.48 (0)	0.469/0.49 (0)	0.468/0.48 (0)
10	0.531/0.55 (0.5)	0.585/0.6 (0.017)	0.591/0.61 (0.011)	0.606/0.635 (0.002)	0.611/0.645 (0.001)	0.625/0.67 (0)	0.624/0.655 (0)	0.631/0.68 (0)	0.632/0.68 (0)	0.638/0.68 (0)
15	0.627/0.66 (0.5)	0.678/0.75 (0.014)	0.677/0.735 (0.014)	0.699/0.755 (0.002)	0.704/0.79 (0.001)	0.704/0.775 (0.001)	0.702/0.76 (0.001)	0.714/0.77 (0)	0.714/0.775 (0)	0.717/0.77 (0)
20	0.681/0.745 (0.5)	0.733/0.81 (0.009)	0.731/0.805 (0.012)	0.749/0.84 (0.001)	0.749/0.825 (0.001)	0.755/0.845 (0)	0.757/0.845 (0)	0.758/0.83 (0)	0.764/0.855 (0)	0.767/0.855 (0)
25	0.72/0.78 (0.5)	0.767/0.835 (0.01)	0.769/0.855 (0.006)	0.779/0.865 (0.001)	0.782/0.865 (0.001)	0.794/0.895 (0)	0.797/0.88 (0)	0.798/0.9 (0)	0.795/0.88 (0)	0.797/0.88 (0)
30	0.751/0.82 (0.5)	0.786/0.89 (0.023)	0.794/0.89 (0.015)	0.814/0.91 (0.001)	0.811/0.9 (0.002)	0.815/0.915 (0)	0.817/0.915 (0)	0.823/0.925 (0)	0.817/0.925 (0)	0.816/0.92 (0)
35	0.773/0.87 (0.5)	0.813/0.91 (0.021)	0.81/0.91 (0.013)	0.825/0.92 (0.001)	0.828/0.94 (0.001)	0.83/0.92 (0)	0.831/0.92 (0.001)	0.839/0.94 (0)	0.838/0.935 (0)	0.841/0.94 (0)
40	0.791/0.89 (0.5)	0.826/0.93 (0.028)	0.834/0.935 (0.007)	0.843/0.945 (0.001)	0.841/0.93 (0.003)	0.847/0.955 (0.001)	0.845/0.95 (0.001)	0.852/0.955 (0)	0.851/0.955 (0)	0.855/0.96 (0)
45	0.809/0.9 (0.5)	0.834/0.94 (0.05)	0.84/0.94 (0.015)	0.857/0.96 (0.001)	0.851/0.96 (0.003)	0.863/0.965 (0)	0.854/0.96 (0.002)	0.862/0.965 (0)	0.863/0.97 (0)	0.866/0.97 (0)

TABLE XVIII: Mean/Median fitness (p-value from single model classifier). Mixed ensemble fit to 10s of data.

Time points/Voters	1	2	3	4	5	6	7	8	9	10
5	0.2010/0.18 (0.5)	0.2420/0.225 (0.035)	0.2380/0.23 (0.107)	0.2520/0.225 (0.047)	0.2550/0.23 (0.048)	0.2590/0.24 (0.026)	0.260/0.24 (0.017)	0.2680/0.23 (0.013)	0.2670/0.245 (0.013)	0.270/0.27 (0.005)
10	0.2880/0.275 (0.5)	0.3240/0.29 (0.15)	0.3280/0.32 (0.086)	0.3470/0.31 (0.045)	0.3430/0.325 (0.064)	0.3560/0.335 (0.013)	0.3540/0.33 (0.025)	0.3590/0.335 (0.025)	0.3610/0.33 (0.017)	0.3670/0.35 (0.014)
15	0.3280/0.28 (0.5)	0.3660/0.335 (0.174)	0.3760/0.37 (0.08)	0.3930/0.38 (0.042)	0.3860/0.34 (0.063)	0.3980/0.4 (0.033)	0.4010/0.36 (0.027)	0.4090/0.385 (0.021)	0.4080/0.405 (0.017)	0.4090/0.42 (0.022)
20	0.3630/0.335 (0.5)	0.4020/0.37 (0.143)	0.3990/0.37 (0.166)	0.4160/0.41 (0.131)	0.420/0.395 (0.084)	0.4320/0.43 (0.046)	0.4250/0.405 (0.073)	0.4360/0.445 (0.037)	0.4320/0.43 (0.054)	0.4350/0.435 (0.043)
25	0.3710/0.33 (0.5)	0.4160/0.415 (0.092)	0.4180/0.38 (0.089)	0.4320/0.385 (0.071)	0.4370/0.41 (0.043)	0.4390/0.435 (0.021)	0.4480/0.435 (0.027)	0.4470/0.455 (0.031)	0.4520/0.44 (0.024)	0.4540/0.49 (0.023)
30	0.3960/0.365 (0.5)	0.4330/0.405 (0.153)	0.440/0.45 (0.143)	0.4530/0.445 (0.077)	0.4450/0.445 (0.123)	0.4610/0.485 (0.055)	0.4540/0.465 (0.089)	0.4680/0.47 (0.044)	0.4670/0.48 (0.043)	0.4730/0.485 (0.043)
35	0.4010/0.405 (0.5)	0.4420/0.41 (0.111)	0.4460/0.42 (0.106)	0.4580/0.44 (0.071)	0.460/0.465 (0.079)	0.4670/0.475 (0.055)	0.4650/0.45 (0.075)	0.4740/0.5 (0.048)	0.4740/0.505 (0.046)	0.4780/0.51 (0.034)
40	0.4180/0.39 (0.5)	0.4470/0.435 (0.275)	0.4550/0.45 (0.179)	0.4670/0.455 (0.13)	0.4670/0.48 (0.14)	0.4760/0.505 (0.102)	0.4750/0.49 (0.094)	0.4860/0.53 (0.071)	0.4840/0.505 (0.073)	0.4850/0.515 (0.069)
45	0.4220/0.425 (0.5)	0.4570/0.41 (0.178)	0.4630/0.455 (0.134)	0.4720/0.495 (0.116)	0.4770/0.49 (0.082)	0.4830/0.505 (0.064)	0.4790/0.525 (0.085)	0.4860/0.53 (0.068)	0.4920/0.53 (0.044)	0.4890/0.555 (0.064)
50	0.4310/0.405 (0.5)	0.4620/0.43 (0.202)	0.4640/0.46 (0.213)	0.4780/0.475 (0.128)	0.4810/0.47 (0.114)	0.4880/0.52 (0.091)	0.4910/0.545 (0.08)	0.4980/0.52 (0.052)	0.4920/0.495 (0.075)	0.4960/0.57 (0.073)
55	0.4410/0.43 (0.5)	0.4620/0.43 (0.31)	0.4690/0.47 (0.245)	0.4870/0.51 (0.135)	0.4820/0.485 (0.167)	0.4890/0.48 (0.106)	0.4940/0.55 (0.102)	0.4990/0.505 (0.089)	0.4940/0.55 (0.108)	0.5020/0.54 (0.075)
60	0.4340/0.395 (0.5)	0.4650/0.455 (0.219)	0.4760/0.475 (0.145)	0.490/0.51 (0.082)	0.4860/0.515 (0.109)	0.4910/0.535 (0.097)	0.4990/0.56 (0.059)	0.4970/0.565 (0.072)	0.50/0.57 (0.057)	0.4980/0.58 (0.076)
65	0.4430/0.41 (0.5)	0.470/0.44 (0.266)	0.4770/0.445 (0.21)	0.490/0.495 (0.135)	0.4940/0.535 (0.107)	0.500/0.54 (0.088)	0.4990/0.555 (0.093)	0.5030/0.585 (0.09)	0.5030/0.575 (0.079)	0.5020/0.55 (0.096)
70	0.4470/0.435 (0.5)	0.4740/0.48 (0.26)	0.4820/0.47 (0.179)	0.4940/0.505 (0.132)	0.4970/0.54 (0.104)	0.5020/0.56 (0.098)	0.5020/0.555 (0.094)	0.5030/0.57 (0.1)	0.5050/0.54 (0.09)	0.5070/0.585 (0.076)
75	0.4470/0.43 (0.5)	0.4750/0.44 (0.235)	0.4790/0.47 (0.199)	0.4950/0.515 (0.109)	0.4980/0.53 (0.092)	0.5010/0.55 (0.098)	0.4990/0.565 (0.108)	0.5090/0.59 (0.064)	0.5040/0.55 (0.09)	0.5130/0.585 (0.058)
80	0.4510/0.42 (0.5)	0.4740/0.43 (0.276)	0.490/0.49 (0.155)	0.4920/0.47 (0.16)	0.4940/0.505 (0.146)	0.5070/0.595 (0.089)	0.50/0.585 (0.123)	0.5050/0.58 (0.111)	0.5110/0.61 (0.069)	0.5110/0.55 (0.077)
85	0.4540/0.42 (0.5)	0.4780/0.44 (0.259)	0.4860/0.485 (0.199)	0.4990/0.515 (0.14)	0.4990/0.525 (0.127)	0.5050/0.555 (0.097)	0.5040/0.55 (0.127)	0.510/0.615 (0.09)	0.5080/0.565 (0.103)	0.5140/0.57 (0.068)
90	0.4540/0.42 (0.5)	0.4840/0.45 (0.221)	0.4850/0.49 (0.234)	0.4980/0.48 (0.14)	0.4970/0.545 (0.169)	0.5070/0.575 (0.106)	0.5060/0.56 (0.127)	0.5110/0.565 (0.088)	0.5090/0.57 (0.109)	0.5140/0.61 (0.085)
95	0.4610/0.475 (0.5)	0.4760/0.455 (0.385)	0.490/0.49 (0.223)	0.5050/0.545 (0.126)	0.5030/0.54 (0.15)	0.5090/0.55 (0.111)	0.510/0.56 (0.111)	0.5150/0.55 (0.111)	0.5150/0.57 (0.088)	0.5170/0.63 (0.085)
100	0.460/0.425 (0.5)	0.4810/0.475 (0.338)	0.490/0.5 (0.23)	0.5020/0.53 (0.165)	0.5030/0.54 (0.146)	0.5070/0.55 (0.144)	0.5150/0.585 (0.087)	0.5120/0.57 (0.124)	0.5130/0.575 (0.108)	0.5190/0.57 (0.078)
105	0.4670/0.445 (0.5)	0.4850/0.48 (0.311)	0.4920/0.465 (0.241)	0.4990/0.48 (0.204)	0.5050/0.52 (0.177)	0.5130/0.585 (0.125)	0.5130/0.585 (0.119)	0.5190/0.59 (0.1)	0.5130/0.555 (0.118)	0.5210/0.575 (0.086)
110	0.4640/0.43 (0.5)	0.4870/0.485 (0.279)	0.4940/0.53 (0.223)	0.5090/0.515 (0.121)	0.5070/0.545 (0.132)	0.5110/0.59 (0.121)	0.5070/0.555 (0.15)	0.5150/0.575 (0.094)	0.5160/0.575 (0.094)	0.5190/0.57 (0.086)
115	0.4630/0.415 (0.5)	0.4850/0.46 (0.281)	0.4920/0.485 (0.216)	0.5050/0.52 (0.152)	0.5040/0.555 (0.161)	0.5130/0.57 (0.107)	0.5120/0.565 (0.118)	0.5150/0.605 (0.111)	0.5130/0.6 (0.116)	0.5210/0.575 (0.078)
120	0.4650/0.415 (0.5)	0.4840/0.465 (0.318)	0.4930/0.465 (0.224)	0.5010/0.525 (0.194)	0.5060/0.55 (0.159)	0.5150/0.56 (0.11)	0.5130/0.565 (0.113)	0.5170/0.6 (0.106)	0.5180/0.6 (0.093)	0.5170/0.585 (0.113)

TABLE XIX: Mean/Median fitness (p-value from single model classifier). Mixed ensemble fit to 20s of data.

Time points/Voters	1	2	3	4	5	6	7	8	9	10
5	0.2190/0.18 (0.5)	0.2610/0.24 (0.018)	0.2590/0.22 (0.038)	0.2750/0.24 (0.011)	0.280/0.24 (0.005)	0.2870/0.25 (0.003)	0.2820/0.24 (0.004)	0.2940/0.25 (0.002)	0.2950/0.265 (0.001)	0.3010/0.275 (0.001)
10	0.3160/0.29 (0.5)	0.3660/0.355 (0.038)	0.3660/0.355 (0.039)	0.3870/0.355 (0.01)	0.3870/0.37 (0.009)	0.40/0.39 (0.003)	0.3980/0.4 (0.003)	0.4040/0.37 (0.004)	0.410/0.395 (0.001)	0.4110/0.42 (0.001)
15	0.3660/0.34 (0.5)	0.4290/0.41 (0.016)	0.4270/0.415 (0.02)	0.4510/0.43 (0.002)	0.4510/0.455 (0.002)	0.4540/0.45 (0.002)	0.4590/0.44 (0.001)	0.4620/0.49 (0.001)	0.4610/0.455 (0.001)	0.4730/0.455 (0.0)
20	0.4150/0.415 (0.5)	0.4640/0.475 (0.047)	0.4660/0.49 (0.037)	0.4880/0.49 (0.009)	0.4920/0.5 (0.006)	0.4990/0.515 (0.003)	0.5050/0.525 (0.002)	0.5040/0.535 (0.002)	0.500/0.525 (0.004)	0.5120/0.525 (0.001)
25	0.4380/0.455 (0.5)	0.4890/0.505 (0.044)	0.4920/0.52 (0.032)	0.5130/0.555 (0.006)	0.5180/0.525 (0.005)	0.5260/0.535 (0.003)	0.5240/0.55 (0.003)	0.5270/0.54 (0.003)	0.5290/0.53 (0.002)	0.5420/0.56 (0.001)
30	0.4630/0.47 (0.5)	0.5120/0.55 (0.04)	0.5150/0.535 (0.037)	0.5370/0.58 (0.007)	0.5310/0.575 (0.013)	0.5530/0.595 (0.001)	0.5480/0.59 (0.002)	0.5530/0.605 (0.002)	0.5550/0.61 (0.001)	0.5560/0.595 (0.002)
35	0.4760/0.5 (0.5)	0.5290/0.565 (0.036)	0.5360/0.6 (0.018)	0.5540/0.58 (0.005)	0.5460/0.595 (0.01)	0.5640/0.65 (0.002)	0.5640/0.585 (0.002)	0.5660/0.65 (0.001)	0.5640/0.63 (0.002)	0.5780/0.68 (0.0)
40	0.4870/0.5 (0.5)	0.5420/0.535 (0.027)	0.5430/0.58 (0.029)	0.5690/0.615 (0.004)	0.5660/0.64 (0.004)	0.580/0.64 (0.001)	0.5760/0.65 (0.001)	0.5880/0.655 (0.0)	0.580/0.655 (0.001)	0.5830/0.645 (0.001)
45	0.4950/0.515 (0.5)	0.5560/0.595 (0.015)	0.5460/0.58 (0.033)	0.580/0.65 (0.002)	0.5730/0.64 (0.003)	0.5840/0.65 (0.001)	0.5830/0.655 (0.001)	0.6020/0.7 (0.0)	0.5950/0.695 (0.0)	0.60/0.71 (0.0)
50	0.5120/0.56 (0.5)	0.5610/0.615 (0.033)	0.5640/0.62 (0.029)	0.5860/0.665 (0.004)	0.5830/0.65 (0.005)	0.5980/0.695 (0.001)	0.5930/0.665 (0.002)	0.6010/0.695 (0.001)	0.5980/0.665 (0.001)	0.610/0.71 (0.0)
55	0.5140/0.56 (0.5)	0.570/0.65 (0.017)	0.5780/0.63 (0.008)	0.5930/0.69 (0.002)	0.5910/0.69 (0.002)	0.600/0.69 (0.001)	0.6050/0.695 (0.001)	0.6080/0.71 (0.0)	0.6110/0.735 (0.0)	0.6110/0.74 (0.0)
60	0.5250/0.555 (0.5)	0.5740/0.64 (0.029)	0.580/0.65 (0.018)	0.5990/0.67 (0.003)	0.5980/0.685 (0.003)	0.6120/0.71 (0.001)	0.6070/0.715 (0.001)	0.6180/0.72 (0.0)	0.6240/0.74 (0.0)	0.620/0.725 (0.0)
65	0.5230/0.555 (0.5)	0.5750/0.64 (0.029)	0.5820/0.68 (0.016)	0.6130/0.71 (0.001)	0.6050/0.69 (0.002)	0.6160/0.73 (0.0)	0.6140/0.725 (0.001)	0.6230/0.75 (0.0)	0.6240/0.755 (0.0)	0.6340/0.765 (0.0)
70	0.5340/0.57 (0.5)	0.5880/0.65 (0.018)	0.6060/0.7 (0.014)	0.6660/0.7 (0.003)	0.610/0.725 (0.002)	0.6180/0.735 (0.001)	0.6170/0.725 (0.001)	0.6250/0.755 (0.0)	0.630/0.765 (0.0)	0.6310/0.76 (0.0)
75	0.530/0.555 (0.5)	0.5990/0.715 (0.005)	0.5930/0.68 (0.01)	0.6170/0.725 (0.001)	0.6120/0.73 (0.001)	0.6260/0.735 (0.0)	0.6260/0.75 (0.0)	0.6350/0.74 (0.0)	0.6320/0.78 (0.0)	0.6340/0.76 (0.0)
80	0.5360/0.56 (0.5)	0.5970/0.69 (0.009)	0.5950/0.69 (0.013)	0.6140/0.725 (0.002)	0.6220/0.735 (0.001)	0.6310/0.76 (0.0)	0.6280/0.755 (0.0)	0.6370/0.765 (0.0)	0.6390/0.775 (0.0)	0.6320/0.765 (0.0)
85	0.5490/0.61 (0.5)	0.590/0.695 (0.028)	0.60/0.71 (0.024)	0.6230/0.73 (0.002)	0.6180/0.73 (0.004)	0.6290/0.75 (0.001)	0.6330/0.77 (0.001)	0.640/0.775 (0.0)	0.640/0.79 (0.0)	0.6420/0.8 (0.0)
90	0.5510/0.615 (0.5)	0.6070/0.69 (0.014)	0.6010/0.7 (0.022)	0.6210/0.74 (0.003)	0.6230/0.735 (0.002)	0.6340/0.76 (0.0)	0.6360/0.76 (0.0)	0.6440/0.78 (0.0)	0.6390/0.775 (0.0)	0.6460/0.82 (0.0)
95	0.5490/0.585 (0.5)	0.6030/0.695 (0.013)	0.6110/0.72 (0.007)	0.6280/0.735 (0.001)	0.6260/0.745 (0.001)	0.6390/0.77 (0.0)	0.6320/0.74 (0.0)	0.6460/0.785 (0.0)	0.6420/0.805 (0.0)	0.6490/0.795 (0.0)
100	0.5540/0.59 (0.5)	0.610/0.72 (0.013)	0.6130/0.71 (0.01)	0.6260/0.76 (0.002)	0.6310/0.76 (0.001)	0.6370/0.79 (0.0)	0.6410/0.78 (0.0)	0.6420/0.805 (0.0)	0.6480/0.8 (0.0)	0.6490/0.805 (0.0)
105	0.5560/0.6 (0.5)	0.6050/0.72 (0.018)	0.6070/0.695 (0.019)	0.6310/0.76 (0.001)	0.6350/0.76 (0.001)	0.640/0.77 (0.0)	0.6460/0.805 (0.0)	0.6480/0.81 (0.0)	0.650/0.79 (0.0)	0.650/0.805 (0.0)
110	0.5520/0.59 (0.5)	0.6040/0.71 (0.016)	0.6190/0.71 (0.005)	0.6370/0.745 (0.001)	0.6290/0.75 (0.001)	0.6450/0.81 (0.0)	0.6420/0.785 (0.0)	0.6460/0.81 (0.0)	0.6520/0.8 (0.0)	0.6560/0.825 (0.0)
115	0.5620/0.59 (0.5)	0.6090/0.71 (0.019)	0.6190/0.73 (0.009)	0.6350/0.76 (0.001)	0.6380/0.75 (0.001)	0.6480/0.795 (0.0)	0.6510/0.795 (0.0)	0.6480/0.79 (0.0)	0.6490/0.795 (0.0)	0.6550/0.82 (0.0)
120	0.5660/0.615 (0.5)	0.6150/0.73 (0.016)	0.6110/0.72 (0.025)	0.6370/0.77 (0.002)	0.6390/0.765 (0.001)	0.6430/0.795 (0.0)	0.6470/0.795 (0.0)	0.6520/0.815 (0.0)	0.660/0.83 (0.0)	0.6580/0.83 (0.0)

TABLE XX: Classification Accuracy for top ensemble fit to all data. Overall Accuracy: 0.8667333333333333 Task Accuracy: 0.916666666667 Walking Like 0.990333333333 Running like 0.9995 Subject Accuracy: 0.904933333333

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Identify Subject
Up	0.96 ± 0.031	0.934 ± 0.073	0.666 ± 0.092	0.884 ± 0.092	0.566 ± 0.182	0.882 ± 0.129	0.864 ± 0.059
Down	0.932 ± 0.05	0.862 ± 0.075	0.616 ± 0.222	0.746 ± 0.249	0.666 ± 0.102	0.856 ± 0.252	0.877 ± 0.058
Walking	1.0 ± 0	0.986 ± 0.004	0.818 ± 0.144	1.0 ± 0	1.0 ± 0	0.994 ± 0.011	0.989 ± 0.015
Jogging	0.96 ± 0.07	0.978 ± 0.039	0.778 ± 0.342	0.966 ± 0.048	0.902 ± 0.056	0.83 ± 0.192	0.967 ± 0.023
Running	0.56 ± 0.335	0.99 ± 0.014	0.998 ± 0.004	0.864 ± 0.167	0.998 ± 0.004	0.81 ± 0.142	0.887 ± 0.075
Identify Subject	0.894 ± 0.129	0.961 ± 0.045	0.796 ± 0.103	0.934 ± 0.086	0.885 ± 0.105	0.96 ± 0.045	

TABLE XXI: Classification Accuracy for top ensemble fit to 10s of data. Overall Accuracy: 0.5208 Task Accuracy

TABLE XXIII: Classification Accuracy for random ensemble fit to all data. Overall Accuracy: 0.857333333333 Task Accuracy: 0.914733333333 Walking Like 0.991111111111 Running like 0.9995 Subject Accuracy: 0.895333333333

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Identify Subject
Up	0.9 ± 0.04	0.926 ± 0.06	0.57 ± 0.044	0.804 ± 0.138	0.576 ± 0.221	0.884 ± 0.128	0.825 ± 0.068
Down	0.944 ± 0.05	0.81 ± 0.083	0.596 ± 0.224	0.734 ± 0.201	0.744 ± 0.14	0.862 ± 0.233	0.897 ± 0.049
Walking	1.0 ± 0	0.984 ± 0.014	0.758 ± 0.223	0.998 ± 0.004	0.996 ± 0.004	0.992 ± 0.014	0.978 ± 0.03
Jogging	0.92 ± 0.14	0.998 ± 0.004	0.772 ± 0.33	0.978 ± 0.03	0.906 ± 0.041	0.758 ± 0.18	0.968 ± 0.019
Running	0.652 ± 0.307	0.978 ± 0.018	0.998 ± 0.004	0.878 ± 0.163	0.996 ± 0.004	0.808 ± 0.137	0.907 ± 0.061
Identify Subject	0.89 ± 0.101	0.948 ± 0.062	0.764 ± 0.116	0.922 ± 0.091	0.894 ± 0.094	0.955 ± 0.05	

TABLE XXIV: Classification Accuracy for random ensemble fit to 10s of data. Overall Accuracy: 0.4518 Task Accuracy: 0.679066666667 Walking Like 0.959666666667 Running like 0.9895 Subject Accuracy: 0.559866666667

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Identify Subject
Up	0.762 ± 0.069	0.054 ± 0.027	0.128 ± 0.042	0.058 ± 0.046	0.55 ± 0.204	0.232 ± 0.091	0.547 ± 0.084
Down	0.882 ± 0.046	0.152 ± 0.054	0.368 ± 0.051	0.232 ± 0.124	0.516 ± 0.176	0.692 ± 0.162	0.686 ± 0.086
Walking	0.784 ± 0.049	0.04 ± 0.03	0.012 ± 0.014	0.004 ± 0.007	0.69 ± 0.124	0.272 ± 0.042	0.56 ± 0.104
Jogging	0.366 ± 0.142	0.76 ± 0.067	0.404 ± 0.171	0.696 ± 0.144	0.118 ± 0.052	0.14 ± 0.101	0.675 ± 0.098
Running	0.422 ± 0.113	0.824 ± 0.088	0.744 ± 0.069	0.89 ± 0.038	0.806 ± 0.045	0.956 ± 0.03	0.928 ± 0.039
Identify Subject	0.723 ± 0.162	0.449 ± 0.357	0.408 ± 0.207	0.435 ± 0.336	0.697 ± 0.224	0.647 ± 0.271	

TABLE XXV: Classification Accuracy for random ensemble fit to 20s of data. Overall Accuracy: 0.5568 Task Accuracy: 0.731466666667 Walking Like 0.977888888889 Running like 0.989666666667 Subject Accuracy: 0.6498

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Identify Subject
Up	0.704 ± 0.176	0.518 ± 0.072	0.39 ± 0.044	0.454 ± 0.167	0.484 ± 0.227	0.632 ± 0.161	0.737 ± 0.072
Down	0.894 ± 0.041	0.404 ± 0.111	0.464 ± 0.187	0.516 ± 0.086	0.588 ± 0.119	0.798 ± 0.25	0.796 ± 0.065
Walking	0.684 ± 0.114	0.066 ± 0.026	0.09 ± 0.06	0.012 ± 0.014	0.698 ± 0.066	0.39 ± 0.067	0.484 ± 0.098
Jogging	0.564 ± 0.145	0.876 ± 0.042	0.468 ± 0.218	0.774 ± 0.131	0.19 ± 0.1	0.138 ± 0.067	0.701 ± 0.105
Running	0.546 ± 0.259	0.912 ± 0.065	0.856 ± 0.098	0.922 ± 0.031	0.716 ± 0.057	0.956 ± 0.024	0.939 ± 0.041
Identify Subject	0.722 ± 0.106	0.604 ± 0.31	0.495 ± 0.207	0.604 ± 0.296	0.681 ± 0.187	0.792 ± 0.196	

TABLE XXVI: Classification Accuracy for mixed ensemble fit to all data. Overall Accuracy: 0.865466666667 Task Accuracy: 0.9164 Walking Like 0.988888888889 Running like 0.9985 Subject Accuracy: 0.903866666667

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Identify Subject
Up	0.924 ± 0.046	0.916 ± 0.076	0.604 ± 0.016	0.844 ± 0.112	0.648 ± 0.187	0.85 ± 0.173	0.84 ± 0.063
Down	0.944 ± 0.069	0.824 ± 0.084	0.546 ± 0.233	0.774 ± 0.198	0.764 ± 0.116	0.87 ± 0.228	0.894 ± 0.048
Walking	1.0 ± 0	0.996 ± 0.007	0.802 ± 0.157	1.0 ± 0	0.998 ± 0.004	0.992 ± 0.01	0.986 ± 0.022
Jogging	0.918 ± 0.144	0.994 ± 0.007	0.786 ± 0.34	0.972 ± 0.049	0.916 ± 0.03	0.83 ± 0.199	0.974 ± 0.019
Running	0.624 ± 0.324	0.954 ± 0.041	1.0 ± 0	0.888 ± 0.146	0.988 ± 0.017	0.798 ± 0.12	0.888 ± 0.07
Identify Subject	0.89 ± 0.106	0.954 ± 0.057	0.779 ± 0.122	0.939 ± 0.076	0.905 ± 0.082	0.956 ± 0.046	

TABLE XXVII: Classification Accuracy for mixed ensemble fit to 10s of data. Overall Accuracy: 0.480533333333 Task Accuracy: 0.692866666667 Walking Like 0.962555555556 Running like 0.994833333333 Subject Accuracy: 0.578133333333

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Identify Subject
Up	0.9 ± 0.088	0.1 ± 0.051	0.098 ± 0.031	0.054 ± 0.036	0.46 ± 0.257	0.212 ± 0.099	0.537 ± 0.086
Down	0.856 ± 0.07	0.18 ± 0.076	0.262 ± 0.085	0.202 ± 0.094	0.664 ± 0.134	0.746 ± 0.213	0.685 ± 0.088
Walking	0.698 ± 0.028	0.034 ± 0.012	0.05 ± 0.034	0.004 ± 0.007	0.824 ± 0.061	0.282 ± 0.063	0.58 ± 0.111
Jogging	0.538 ± 0.157	0.934 ± 0.041	0.528 ± 0.23	0.692 ± 0.167	0.096 ± 0.023	0.2 ± 0.137	0.733 ± 0.1
Running	0.554 ± 0.149	0.848 ± 0.144	0.85 ± 0.091	0.856 ± 0.054	0.764 ± 0.053	0.93 ± 0.066	0.929 ± 0.041
Identify Subject	0.776 ± 0.126	0.479 ± 0.369	0.425 ± 0.242	0.425 ± 0.335	0.713 ± 0.239	0.65 ± 0.289	

TABLE XXVIII: Classification Accuracy for mixed ensemble fit to 20s of data. Overall Accuracy: 0.5828 Task Accuracy: 0.741466666667 Walking Like 0.978666666667 Running like 0.993166666667 Subject Accuracy: 0.669

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Identify Subject
Up	0.714 ± 0.153	0.642 ± 0.095	0.394 ± 0.036	0.48 ± 0.161	0.526 ± 0.257	0.708 ± 0.182	0.763 ± 0.068
Down	0.872 ± 0.053	0.35 ± 0.096	0.524 ± 0.187	0.588 ± 0.102	0.67 ± 0.108	0.81 ± 0.273	0.792 ± 0.061
Walking	0.726 ± 0.095	0.06 ± 0.038	0.1 ± 0.065	0.004 ± 0.004	0.724 ± 0.094	0.28 ± 0.087	0.467 ± 0.106
Jogging	0.586 ± 0.135	0.908 ± 0.062	0.534 ± 0.234	0.8 ± 0.153	0.166 ± 0.088	0.202 ± 0.081	0.754 ± 0.099
Running	0.654 ± 0.323	0.892 ± 0.108	0.908 ± 0.068	0.924 ± 0.06	0.798 ± 0.092	0.94 ± 0.035	0.931 ± 0.049
Identify Subject	0.74 ± 0.089	0.62 ± 0.316	0.537 ± 0.213	0.626 ± 0.294	0.723 ± 0.217	0.767 ± 0.224	

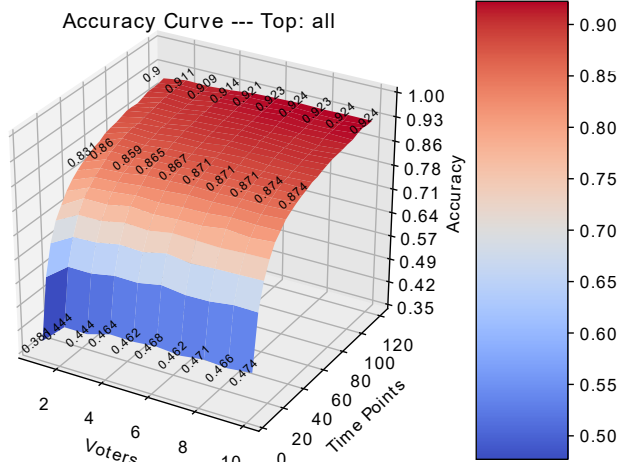


Fig. 17: Accuracy Curve for top ensemble fit with all data.

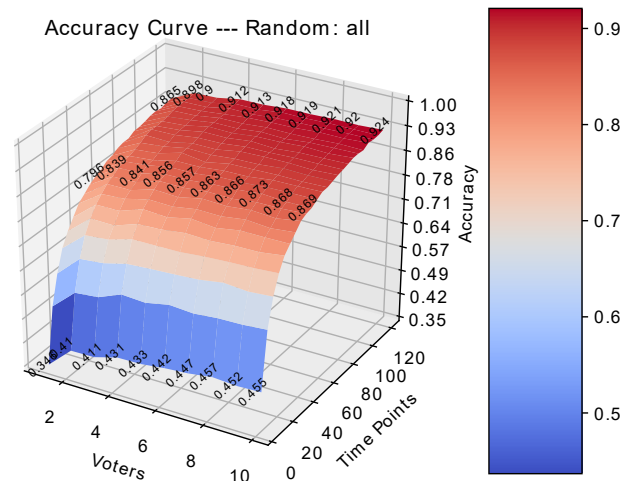


Fig. 20: Accuracy Curve for random ensemble fit with all data.

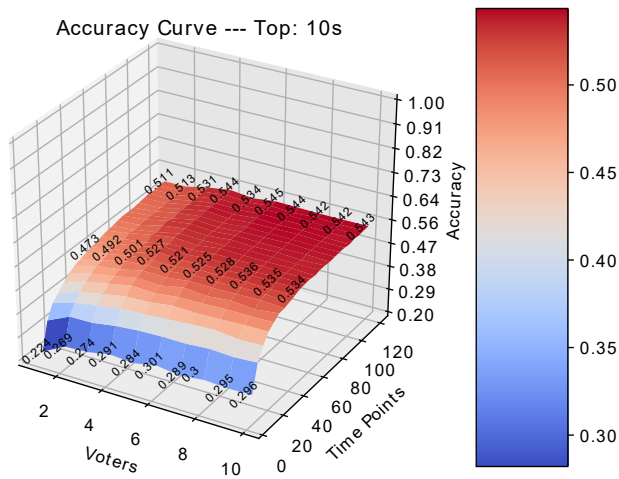


Fig. 18: Accuracy Curve for top ensemble fit with 10s of data.

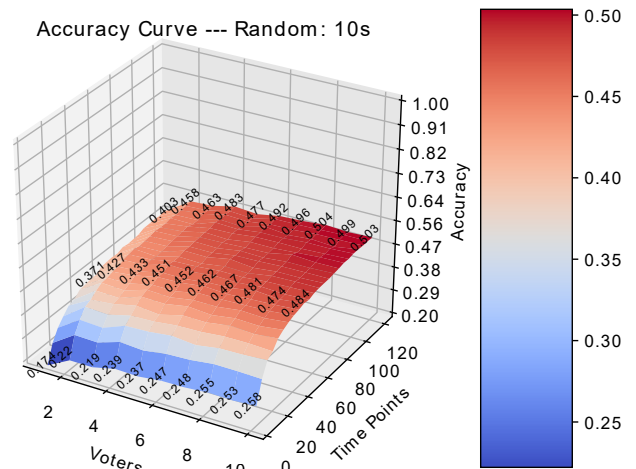


Fig. 21: Accuracy Curve for random ensemble fit with 10s of data.

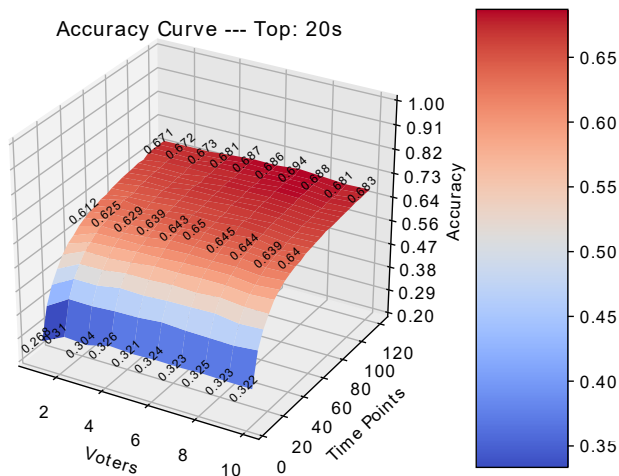


Fig. 19: Accuracy Curve for top ensemble fit with 20s of data.

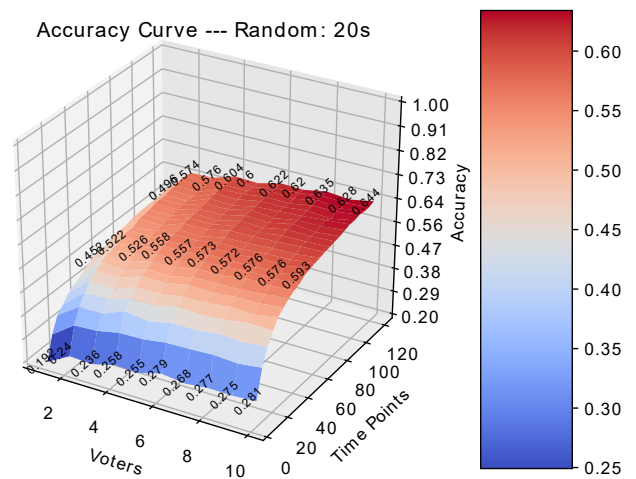


Fig. 22: Accuracy Curve for random ensemble fit with 20s of data.

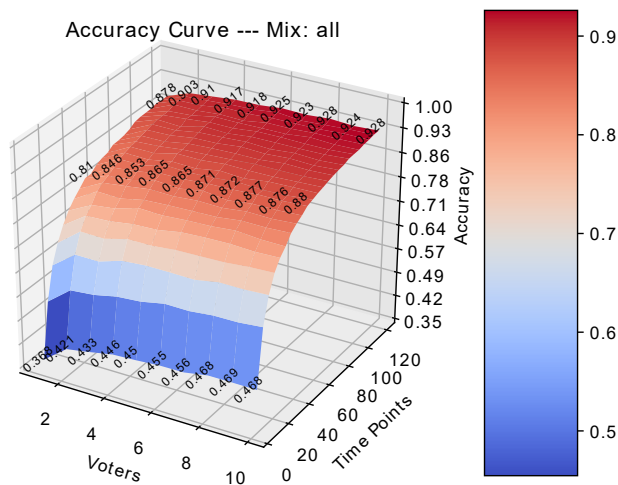


Fig. 23: Accuracy Curve for mixed ensemble fit with all data.

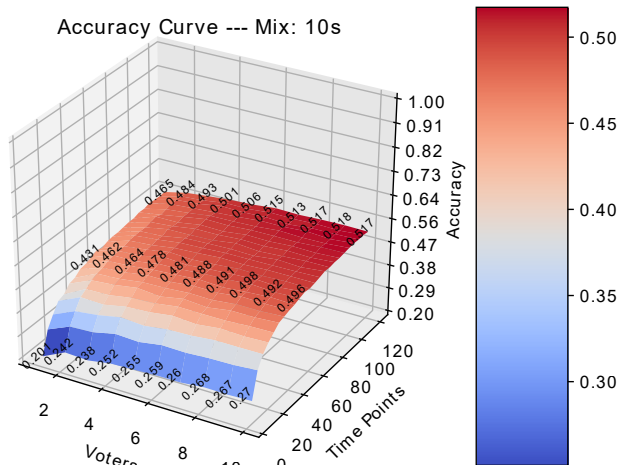


Fig. 24: Accuracy Curve for mixed ensemble fit with 10s of data.

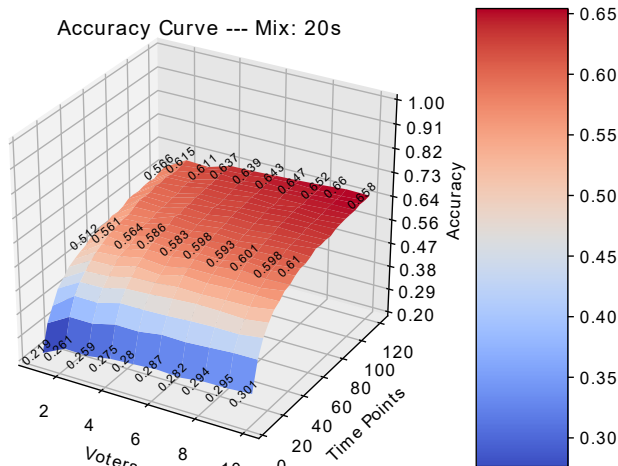


Fig. 25: Accuracy Curve for mixed ensemble fit with 20s of data.

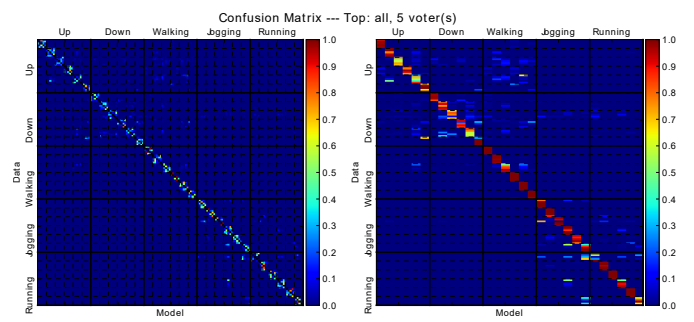


Fig. 26: Classification confusion matrix for top ensemble fit to all data.

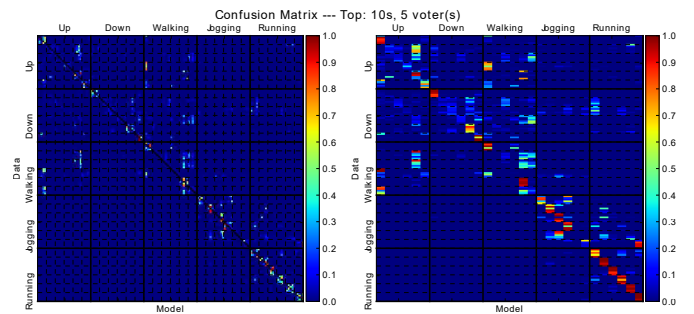


Fig. 27: Classification confusion matrix for top ensemble fit to 10s of data.

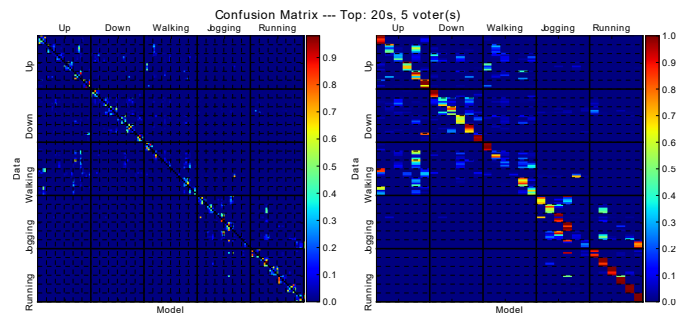


Fig. 28: Classification confusion matrix for top ensemble fit to 20s of data.

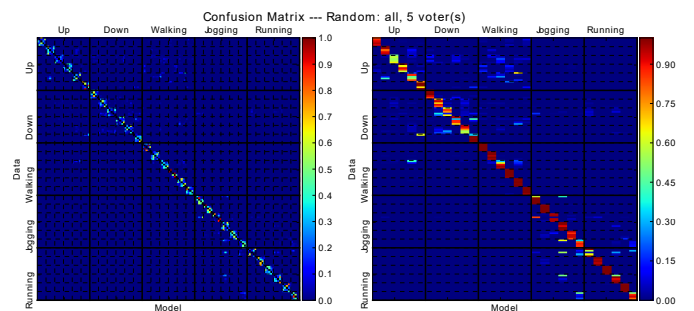


Fig. 29: Classification confusion matrix for random ensemble fit to all data.

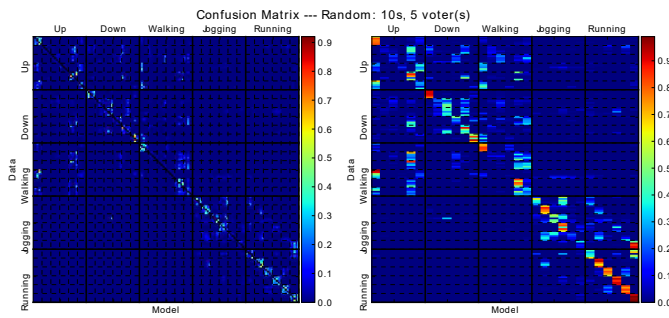


Fig. 30: Classification confusion matrix for random ensemble fit to 10s of data.

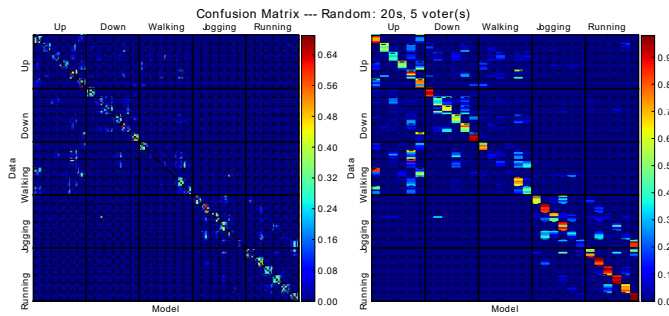


Fig. 31: Classification confusion matrix for random ensemble fit to 20s of data.

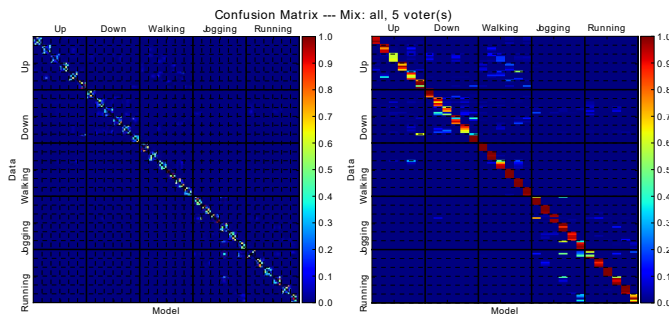


Fig. 32: Classification confusion matrix for mixed ensemble fit to all data.

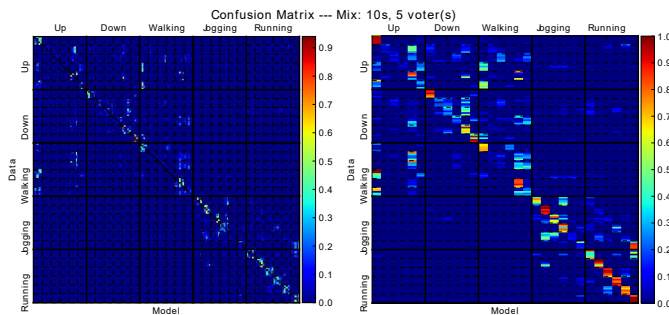


Fig. 33: Classification confusion matrix for mixed ensemble fit to 10s of data.

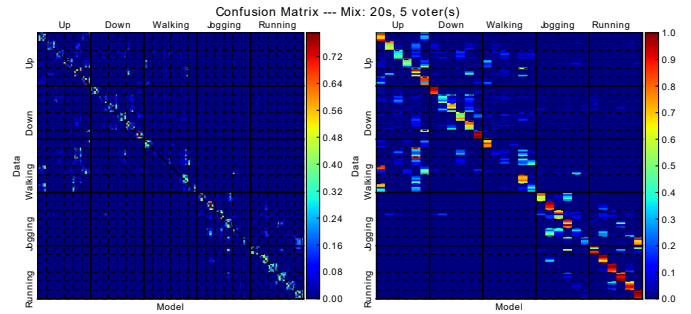


Fig. 34: Classification confusion matrix for mixed ensemble fit to 20s of data.

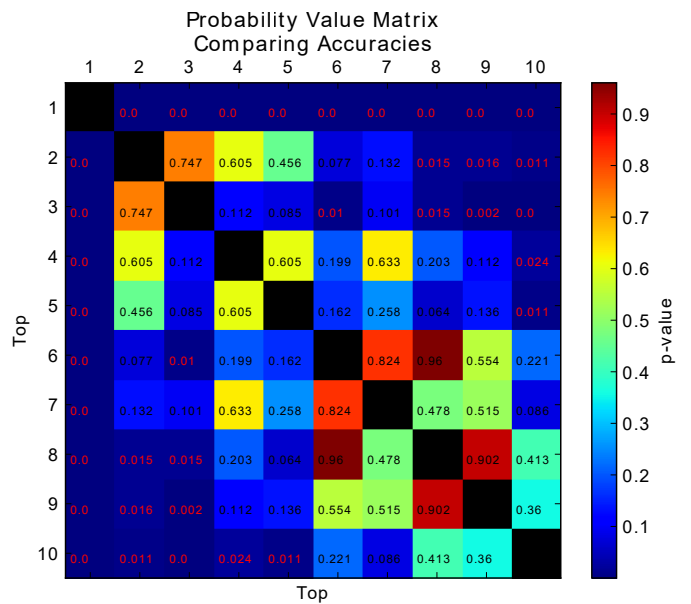


Fig. 35: Top ensemble classifier vs. top ensemble classifier when models were fit to all data and classifier was given 50 time points.

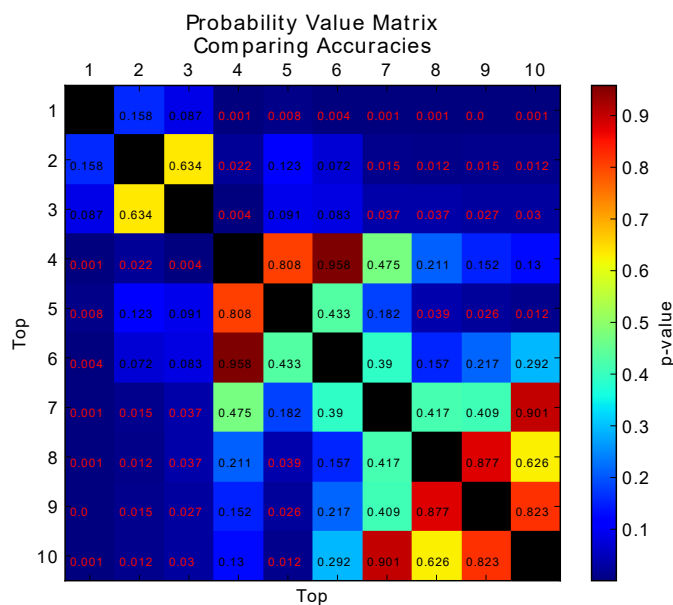


Fig. 36: Top ensemble classifier vs. top ensemble classifier when models were fit to 10s of data and classifier was given 50 time points.

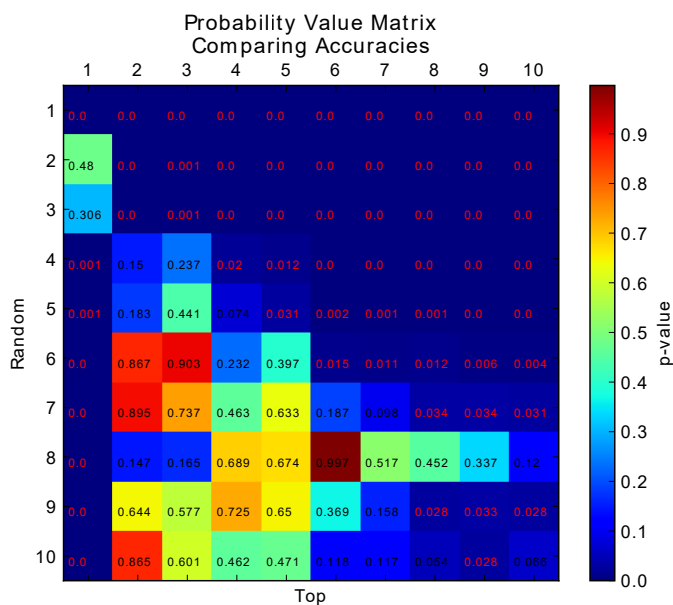


Fig. 38: Random ensemble classifier vs. top ensemble classifier when models were fit to all data and classifier was given 50 time points.

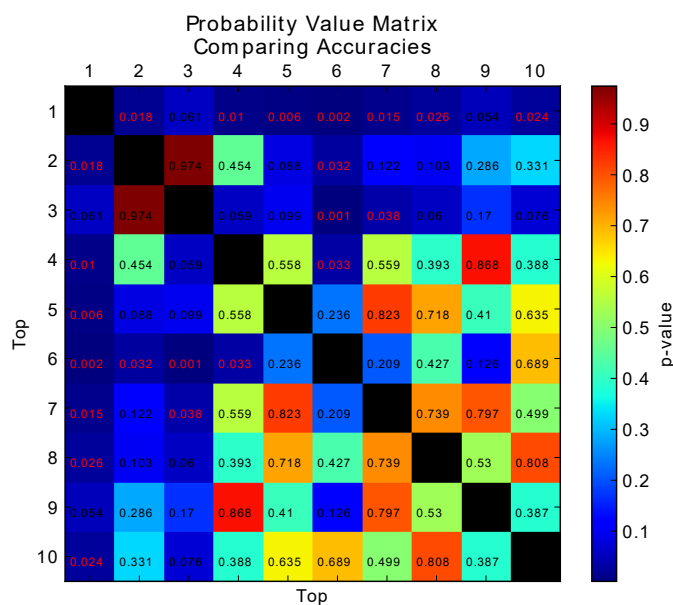


Fig. 37: Top ensemble classifier vs. top ensemble classifier when models were fit to 20s of data and classifier was given 50 time points.

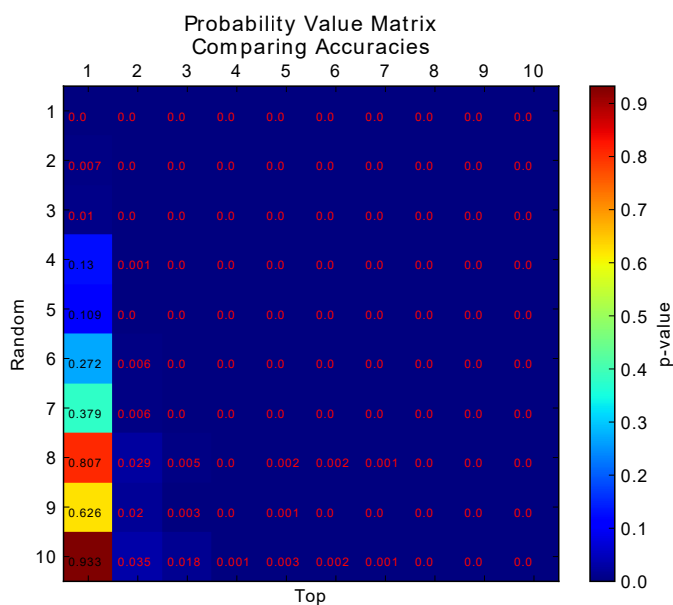


Fig. 39: Random ensemble classifier vs. top ensemble classifier when models were fit to 10s of data and classifier was given 50 time points.

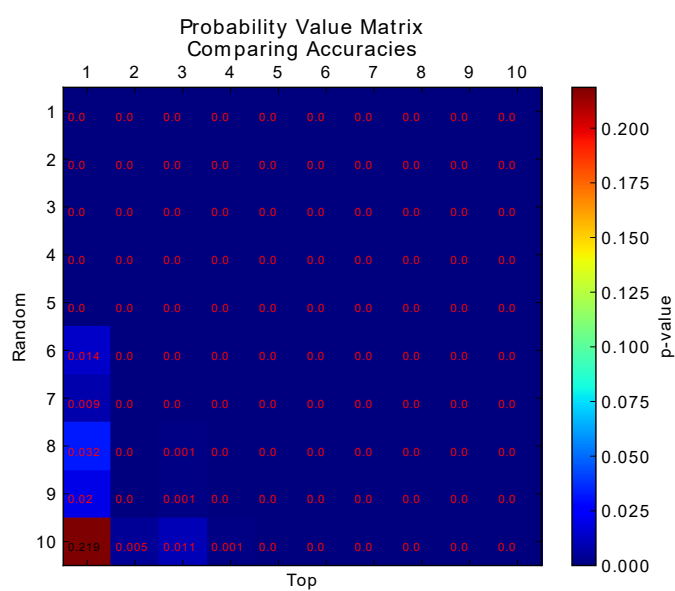


Fig. 40: Random ensemble classifier vs. top ensemble classifier when models were fit to 20s of data and classifier was given 50 time points.