

Sorting through the Safety Data Haystack: Using Machine Learning to Identify Individual Case Safety Reports (ICSRs) in Social-Digital Media

Drug Safety

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Electronic Supplementary Material 4 Full Analysis of Classifier Performance Metrics

Please refer to Electronic Supplementary Material 3 for the equations for calculating all performance metrics

Analysis of Iteration I Classifier Performance (Figure 3b)

Human Subject Matter Expert (SME) vs Automated Classifier (AC) Classification Counts					SME vs AC Classification %			
ICSR (YES/NO)?		SME			SME			
		Yes	No	Totals		Yes	No	
AC	Yes	10	29	39	Yes	6.6%	19.1%	25.7%
	No	23	90	113	No	15.1%	59.2%	74.3%
Totals		33	119	152		21.7%	78.3%	100.0%

Sensitivity =	30.3%
Specificity =	75.6%
Accuracy =	65.8%
Error Rate =	34.2%
Positive Predictive Value =	25.6%
Negative Predictive Value =	79.6%
Prob_AC1(Expected) =	36.1%
Gwet AC1 Score =	46.4%
F-Score (Fs) =	27.8%

Analysis of Iteration II Classifier Performance (Figure 3c)

Human Subject Matter Expert (SME) vs Automated Classifier (AC) Classification Counts					SME vs AC Classification %			
ICSR (YES/NO)?		SME			SME			
		Yes	No	Totals		Yes	No	
AC	Yes	16	22	38	Yes	10.5%	14.5%	25.0%
	No	17	97	114	No	11.2%	63.8%	75.0%
Totals		33	119	152		21.7%	78.3%	100.0%

Sensitivity =	48.5%
Specificity =	81.5%
Accuracy =	74.3%
Error Rate =	25.7%
Positive Predictive Value =	42.1%
Negative Predictive Value =	85.1%
Prob_AC1(Expected) =	35.8%
Gwet AC1 Score =	60.0%
F-Score (Fs) =	45.1%

Analysis of Iteration III Classifier Performance (Figure 5a)

Human Subject Matter Expert (SME) vs Automated Classifier (AC) Classification Counts					SME vs AC Classification %			
ICSR (YES/NO)?		SME			SME			
		Yes	No	Totals		Yes	No	
AC	Yes	58	229	287	Yes	4.3%	16.9%	21.1%
	No	5	1066	1071	No	0.4%	78.5%	78.9%
Totals		63	1295	1358		4.6%	95.4%	100.0%

Sensitivity =	92.1%
Specificity =	82.3%
Accuracy =	82.8%
Error Rate =	17.2%
Positive Predictive Value =	20.2%
Negative Predictive Value =	99.5%
Prob_AC1(Expected) =	22.5%
Gwet AC1 Score =	77.8%
F-Score (Fs) =	33.1%