Evaluation: From precision, recall, and F-measure to ROC, informedness, markedness and correlation

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Evaluation: from precision, recall and F-measure to ROC, informedness, markedness and correlation DMW Powers International Journal of Machine Learning Technology 2 (1), 37-63	1113	2011
Evaluation: from precision, recall and F-factor to ROC, informedness, markedness and correlation DMW Powers School of Informatics and Engineering Technical Reports (24p ver.of ECAI ...	~~1110~~ *	2007
Measuring semantic similarity in the taxonomy of WordNet D Yang, DMW Powers Proceedings of the Twenty-eighth Australasian conference on Computer Science ...	166	2005
Indexing system and method R Steele, D Powers US Patent 20,030,191,737	116 *	2003
Applications and explanations of Zipf's law DMW Powers Proceedings of the joint conferences on new methods in language processing ...	97	1998

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Introduction

- Contingency table

	+R	−R	
+P	tp	fp	pp
−P	fn	tn	pn
	rp	rn	1

	+R	−R	
+P	A	B	A+B
−P	C	D	C+D
	A+C	B+D	N

- Measure to evaluate Machine Learning System

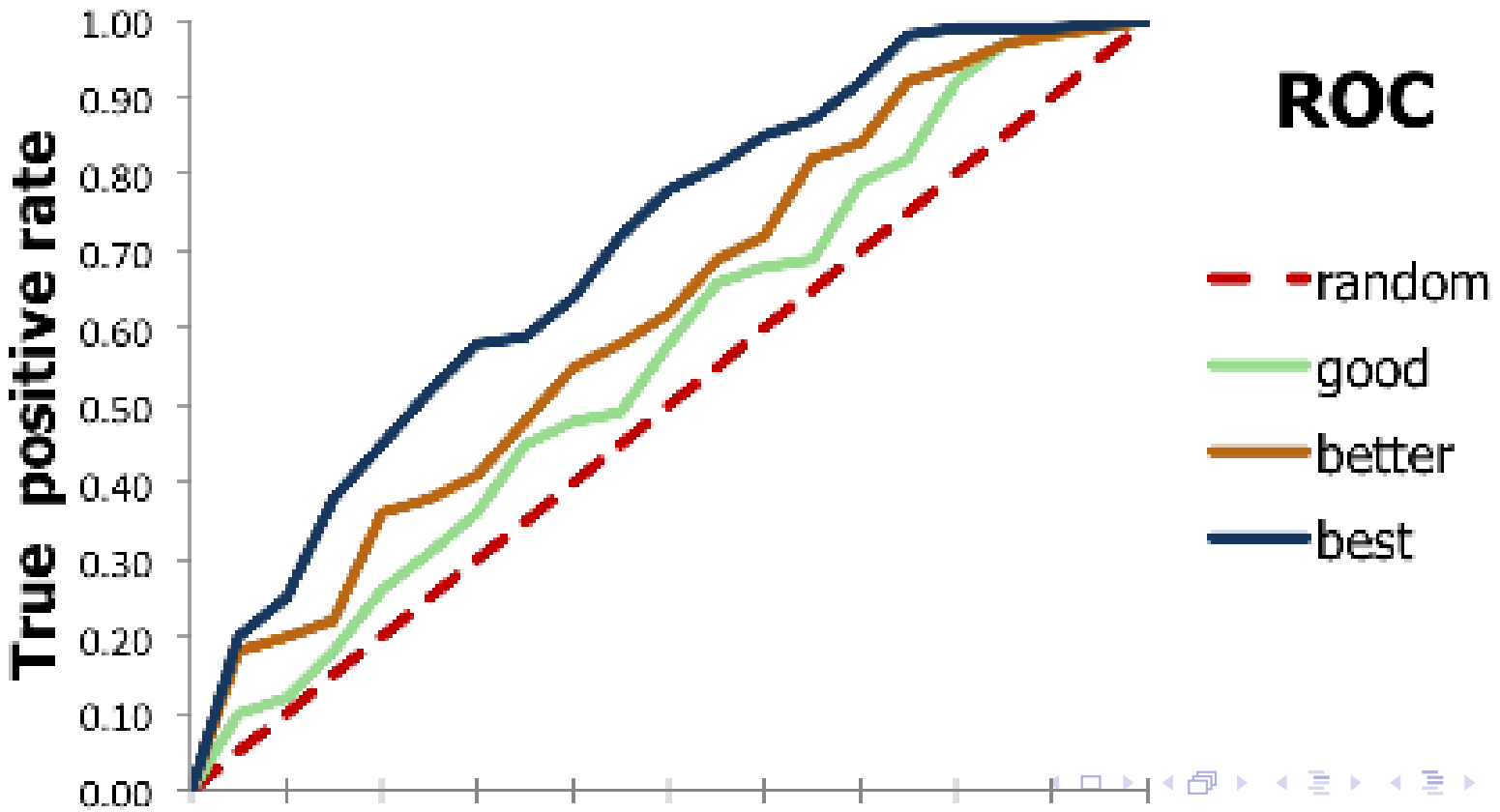
1. Precision
2. Recall
3. F Measure
4. Issues with them

- Alternate Techniques

1. Accuracy
2. Cohen Kappa

ROC Analysis

- ROC analysis give geometric insights into the nature of the measures and their sensitivity to skew
- Compare Classifiers
- Choose parameters based on maximization of AUC



Informedness and Markedness

- Markedness

Markedness quantifies how marked a condition is for the specified predictor, and specifies the probability that a condition is marked by the predictor (versus chance).

Markedness is a deep measure of how consistently the outcome has the Predictor as a Marker by combining surface measures about what proportion of Predictions are correct

Precision + Inverse Precision - 1

- Informedness

Informedness quantifies how informed a predictor is for the specified condition, and specifies the probability that a prediction is informed in relation to the condition (versus chance).

Informedness is a deep measure of how consistently the predictor predicts the outcome by combining surface measures about what proportion of outcomes are correctly predicted.

Regression

- Linear Regression
- Estimating Coefficients

1. Rp
2. Rr
3. Rg

Conclusion

Infromedness usually is a better evaluation measure in binary classification.

Further work to research into the multiclass application of the technique.

Explore the relationship between Infromedness and Markedness

We have a better and a more intuitive understanding of the mearues that we could use for evaluating our ML system.

- Accuracy
- Cohen Kappa
- Precision
- Recall
- F1-Score
- Bookmaker Informedness / Delta P'
- Markedness

Skipped

- Significance
- Montecarlo Simulation
- Evenness (Used in multiclass problems)