

APPENDIX

PREDICTION RESULTS PER PROJECT

To support detailed views of our experiment's results, this appendix section illustrates those results per project for each of the different architectural metrics that our models predict. Similar to the results of figures in Section 5, each of the box plots correspond to a particular recovery technique (ARC or packages) and one of the three regression models, i.e., RF (F), LR (L), or NBR (N). Figure 11 shows AUC results per project for predicting the CF values of modules; Figure 12 depicts the ranking results per project for CF values compared using Spearman correlation. Figure 13 presents AUC results for defect existence prediction; Figure 14 illustrates results for module defectiveness using Spearman correlation to rank defective modules. Figure 15 depicts results for architectural smell prediction; Figure 16 shows results for prediction of architectural smell emergence. Note that for the combinations of packages and Cassandra, and packages and OpenJPA, architectural smell emergence does not occur.

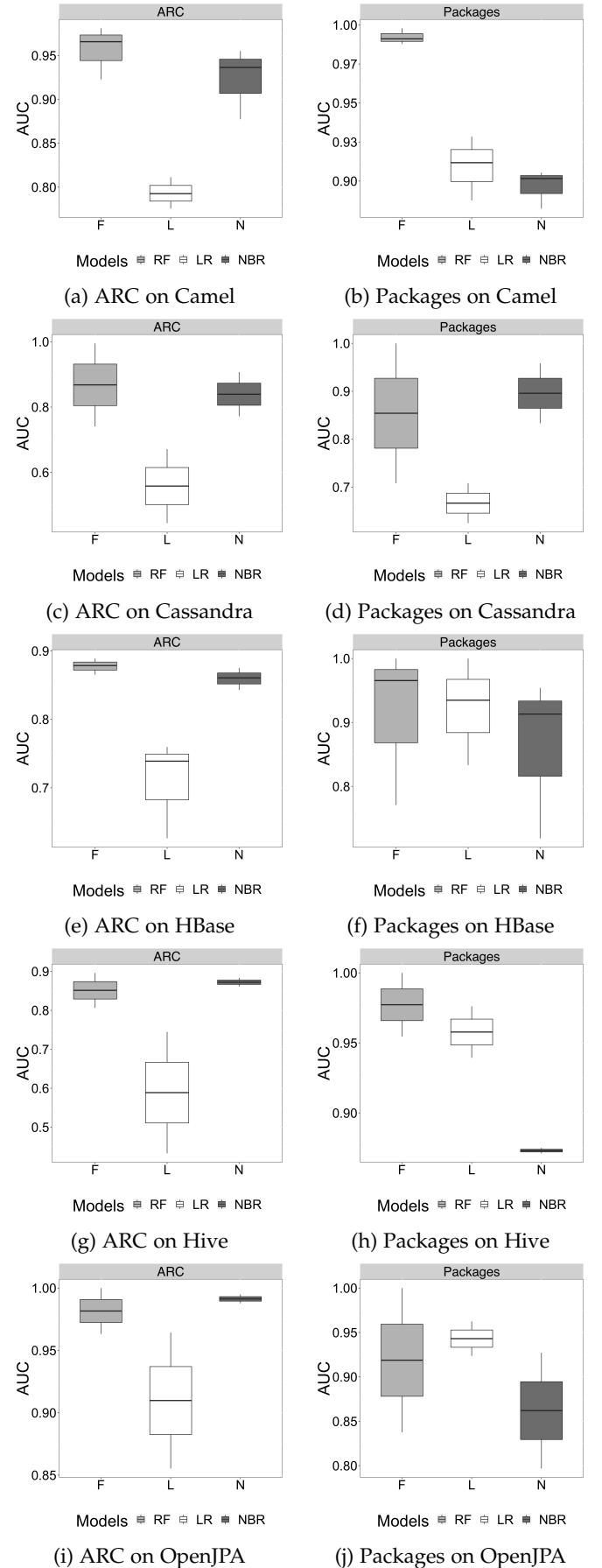


Fig. 11: Cluster Factor AUC Prediction Performance Per Project

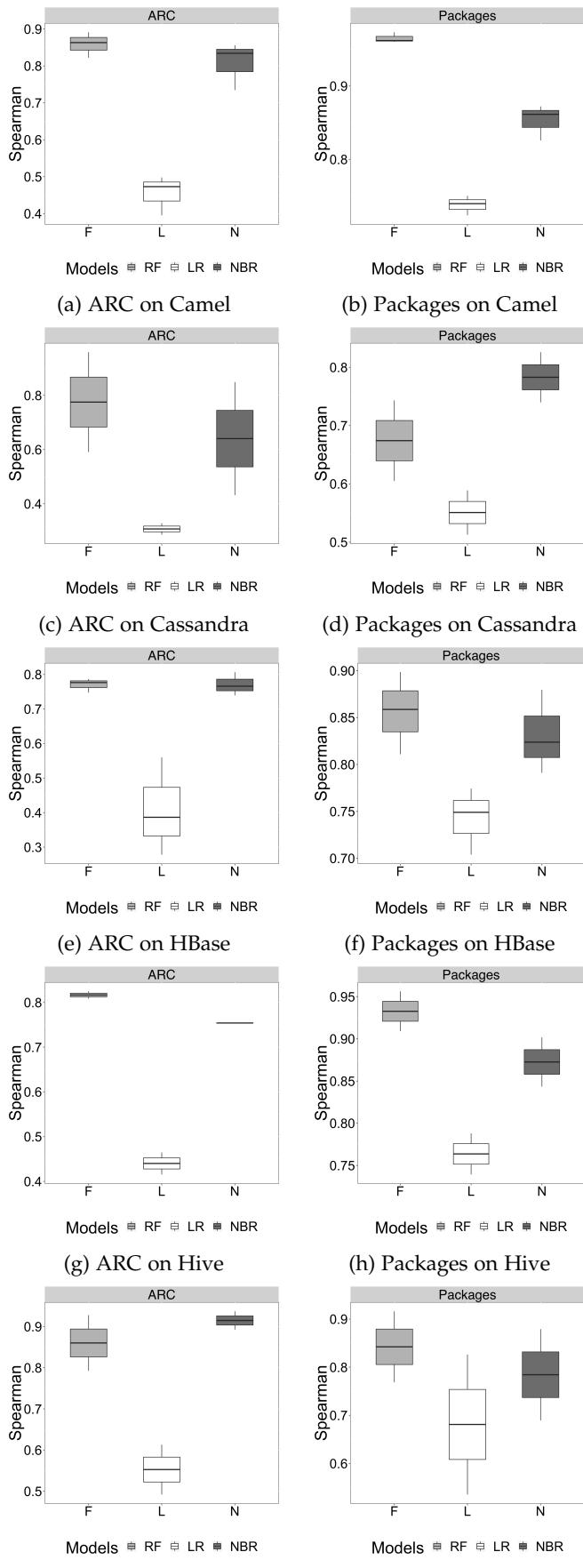


Fig. 12: Cluster-Factor Spearman-Correlation Performance Per Project

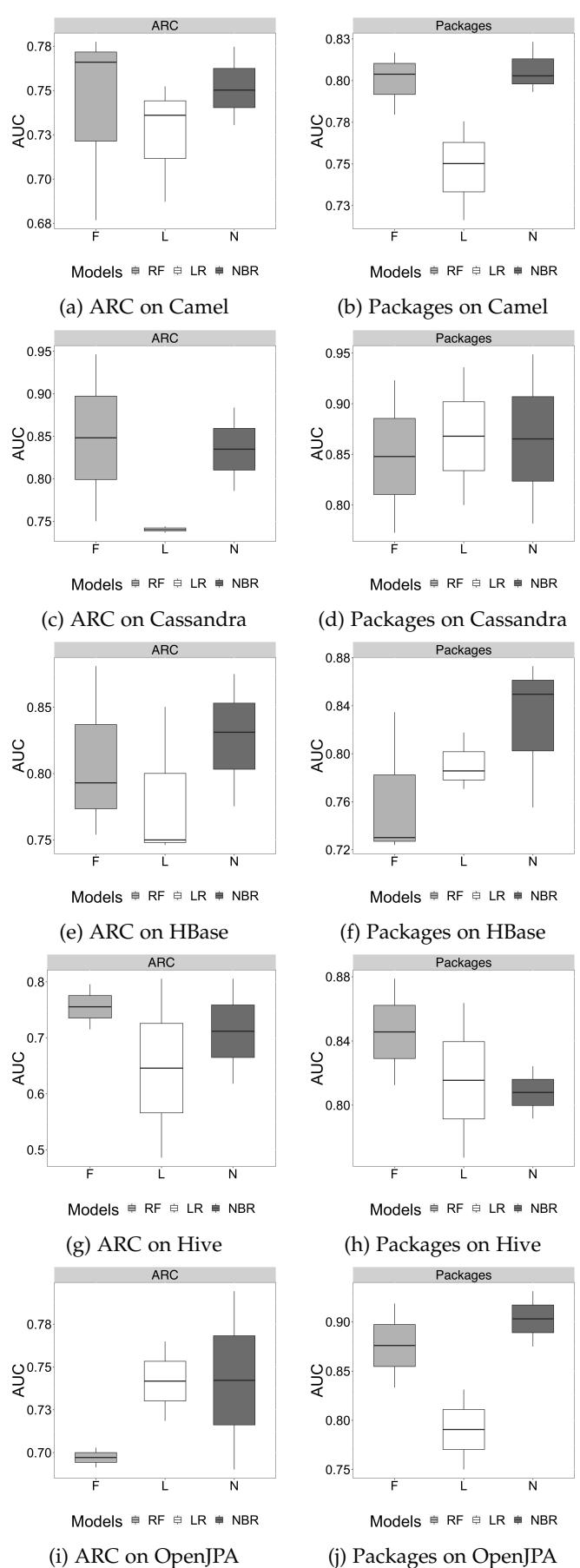
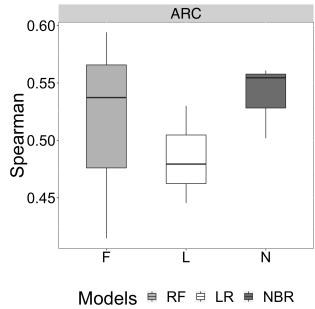
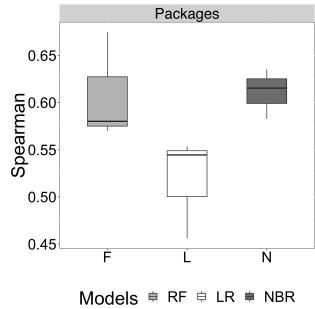


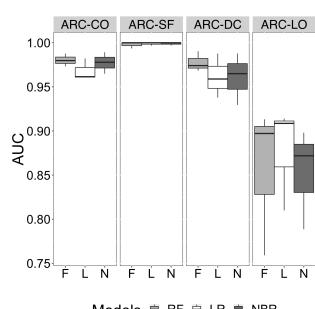
Fig. 13: AUC Performance for Defect Prediction Per Project



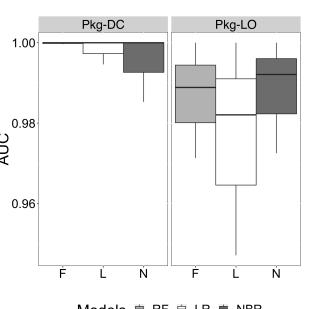
(a) ARC on Camel



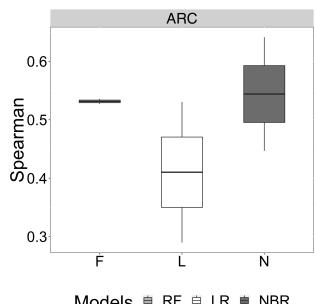
(b) Packages on Camel



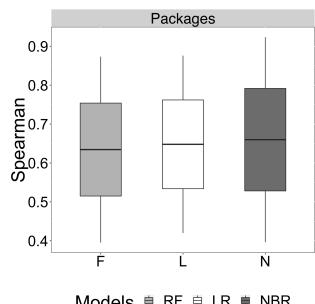
(c) ARC on Camel



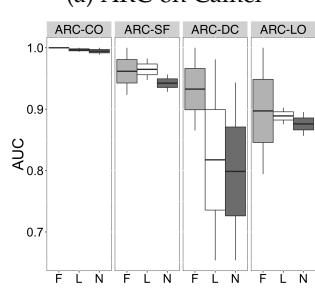
(d) Packages on Camel



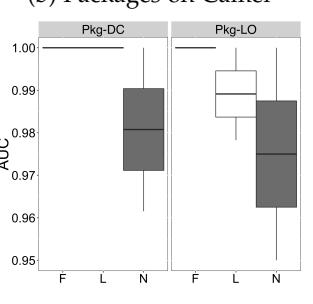
(e) ARC on Cassandra



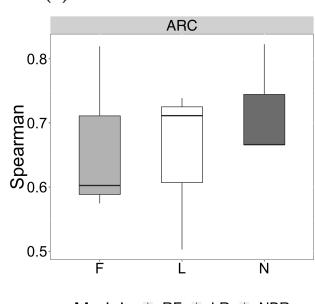
(f) Packages on Cassandra



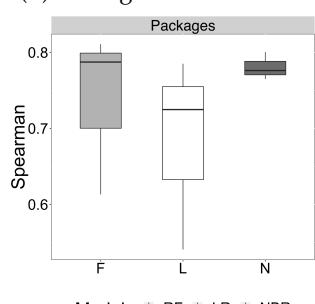
(g) ARC on Cassandra



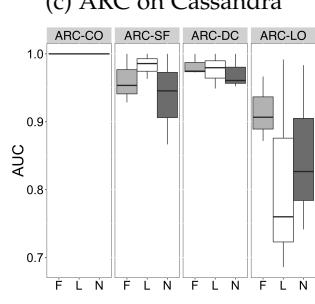
(h) Packages on Cassandra



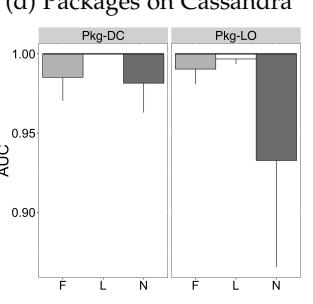
(i) ARC on HBase



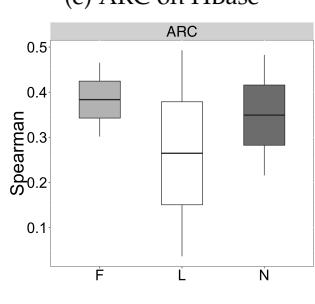
(j) Packages on HBase



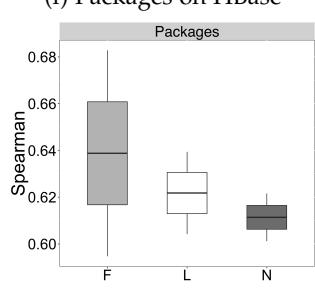
(k) ARC on HBase



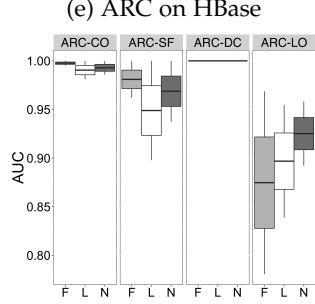
(l) Packages on HBase



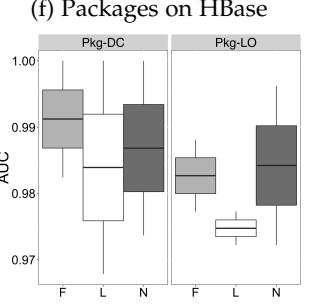
(m) ARC on Hive



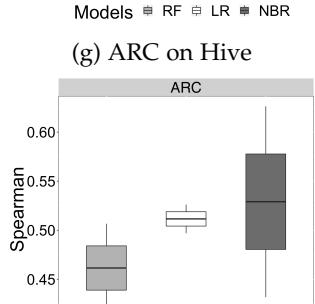
(n) Packages on Hive



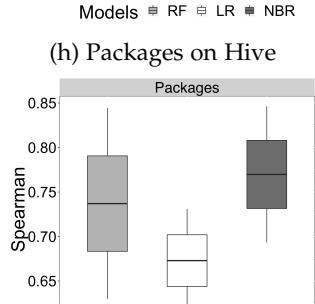
(o) ARC on Hive



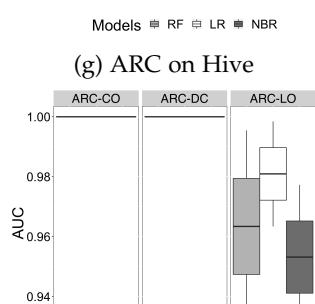
(p) Packages on Hive



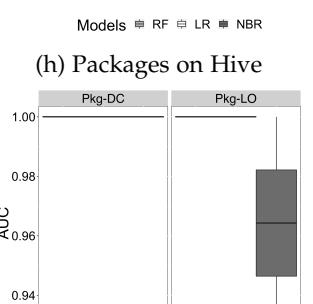
(q) ARC on OpenJPA



(r) Packages on OpenJPA



(s) ARC on OpenJPA



(t) Packages on OpenJPA

Fig. 14: Spearman Correlation for Ranking Defective Modules Per Project

Fig. 15: AUC Architectural Smells Performance Per Project

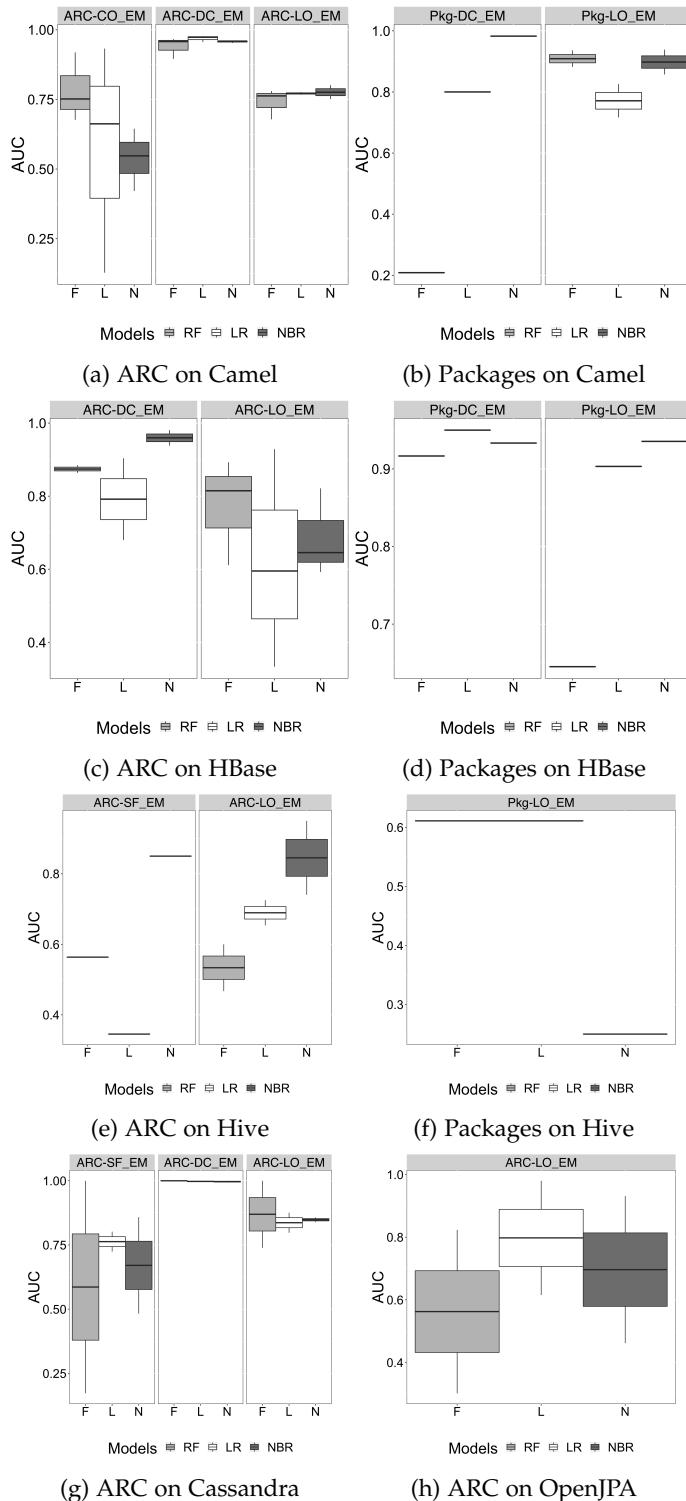


Fig. 16: AUC Performance for Architectural Smell Emergence Per Project