Online Resource 4 XGBoost method coverage extension

Label Budget Trade-offs and Calibration Transfer in GNSS Spoofing Detection

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This extension was specified after the original LR/RF/metric results on all four cohorts had been inspected. It is not an additional blind confirmation or a claim of superiority to specialized GNSS detectors. XGBoost 3.4.1 uses depth 3, learning rate 0.05, 200 rounds, min_child_weight=1, L2=1, L1=0, full row/column sampling and CPU single-thread execution. Standardization is fitted only on the original 2k support rows; no validation set, early stopping or target-source adaptation is used. The score is P(Counterfeit). Thresholds use the original normal-calibration identities and integer rank rule, independently recalculated from the new scorer.

The study adds 45 estimators and 1,080 calibrated cells in each domain. All 72 condition means are supplied in the accompanying table. Arlington values are equal-weight means over three test cohorts; Blacksburg values reuse one cohort across six source roles and five seeds. These are descriptive summaries, not independent acquisitions; no population confidence intervals or p-values are reported. No configurations were changed after observing XGBoost performance.

Table OR4.1 is provided as Table_OR4_1.csv: 72 data rows. Column headings and displayed precision are preserved from the archived supplement. The table is not filtered.

Model states, scores, stage identities and all 2,160 calibrated cells are archived. Independent support-only refits reproduce all 45 learned states; scorer replay and metric recalculation pass. The four original cohort performances remain exposed for any subsequent analysis. This fixed configuration does not estimate the performance ceiling of tuned XGBoost. At low support size the scorer can have as few as two distinct predictions; all such outcomes and ties are retained.