

Research Gaps and Our Solutions

Gap 1: Schema Isolation

Solution: Integrated framework across LOC/FP/UCP

Gap 2: Uncalibrated Baselines

Solution: Calibrated power-law baseline

Gap 3: Sample Imbalance

Solution: Macro-averaging (equal schema weight)

Gap 4: Limited Validation

Solution: LOSO for cross-source generalization

★ Key Innovation: First integrated ML framework with macro-averaging ★

42% improvement over calibrated baseline (MAE: 18.45 → 12.66 PM)