

# 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)*