Model Card — PsP Detection (Research Prototype)

Intended Use

Research prototype to assist algorithm development for PsP (pseudoprogression) detection in glioblastoma.

Not a clinical device. Not for diagnostic or therapeutic decisions. Suitable for retrospective studies and method exploration

Inputs

(1) Longitudinal tabular metrics (Δ% vs baseline/previous, pseudo-RANO features).

(2) Montage 2×2 images reduced to CLIP PCA components.

Outputs: PsP probability (stacked model) and triage category (RED/YELLOW/GREEN).

Training Data

LUMIERE GBM dataset — 91 patients, 599 timepoints.

Supervised set: 121 labeled timepoints (61 PsP / 60 TP). Patient-level LOOCV.

Cross-device variability (Siemens 3T, Philips 3T, GE 1.5T).

Labeling

AI ensemble consensus (3 models) with majority vote. Labels represent imaging phenotypes (PsP vs TP) — not clinical gr

Longitudinal sanity checks applied (exclusion on temporal contradictions, re-check on implausible volumetric jumps).

Model Architecture

Base learners: (a) Logistic Regression pipeline over tabular + CLIP-PCA, (b) LightGBM over the same feature set.

Meta-learner: Calibrated Logistic Regression over [p_LR, p_LGBM]. Class weights balanced; probability calibration via sig

Performance (patient-level LOOCV)

STACK — AUROC=0.760, AUPRC=0.739, Brier=0.201, ECE(10)=0.102.

Random-label sanity checks included. See report/psp/*.json and plots in report/psp/.

Triage Mapping

RED ≥ 0.6, YELLOW ≥ 0.53, GREEN < 0.53.

Intended for research triage/visualization; thresholds chosen via decision-curve analysis on LOOCV predictions.

Limitations

Small N (121 examples). Domain shift across scanners not fully controlled (planned leave-scanner-out CV).

Labels are pseudo-labels from AI consensus, not histopathological truth.

Potential temporal confounding despite controls. No clinical utility claims.

Safety & Ethics

For research only. Do not deploy in clinical workflow. Human oversight required for any interpretation.

No PHI in the repo; de-identified dataset assumptions apply. Follow institutional IRB/ethics where applicable.