

A OAI Data

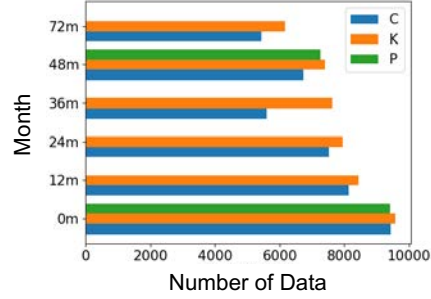


Fig. 4: Data availability across modalities and views in the OAI dataset, up to 72m. The 96m data points are excluded as they were not utilized as input. Pelvis data is only available at 0m and 48m.

B Tabular Data

Attribute	Explanation	Attribute	Explanation
AGE	Age	SEX	Gender, male or female
RACE	Racial background	HISP	Hispanic or Latino
MARITST	Marital status	BMI	Body mass index
BPSYS	Blood pressure: systolic	BPDIAS	Blood pressure: diastolic
EDCV	Highest grade or year of school completed	CEMPLOY	Current employment
CUREMP	Currently work for pay	INCOME2	Yearly income (> 50K or < 50K)
SMOKE	Have you smoked at least 100 cigarettes in entire life	DRNKAMT	How many alcoholic drinks in typical week, past 12 months
DRKMORE	Ever drink more beer, wine or liquor than do now	FAMHXKR	Mother, father, sister, or brother had knee repl surgery where all/part of knee replaced
MEDINS	Have any health insurance plan that pays for all or part of cost of prescription medicines	SIDE	Right or left side of the prediction

Table 2: Attributes and their explanations that were used for our tabular dataset.

C Model Results

Views				Pain Prediction			KLG Prediction		
T	C	K	P	AP	ROC	Macro ACC	AP	ROC	Macro ACC
✓				0.302 ± 0.003	0.640 ± 0.002	0.600 ± 0.003	0.312 ± 0.003	0.618 ± 0.005	0.336 ± 0.011
	✓			0.284 ± 0.004	0.661 ± 0.003	0.618 ± 0.005	0.660 ± 0.005	0.875 ± 0.002	0.642 ± 0.007
		✓		0.325 ± 0.004	0.697 ± 0.001	0.648 ± 0.005	0.699 ± 0.009	0.881 ± 0.003	0.647 ± 0.012
✓	✓			0.339 ± 0.003	0.696 ± 0.002	0.636 ± 0.004	0.672 ± 0.005	0.880 ± 0.003	0.652 ± 0.008
✓		✓		0.357 ± 0.003	0.713 ± 0.002	0.655 ± 0.002	0.707 ± 0.009	0.886 ± 0.002	0.644 ± 0.016
✓	✓	✓		0.306 ± 0.004	0.653 ± 0.003	0.604 ± 0.003	0.315 ± 0.003	0.618 ± 0.003	0.319 ± 0.008
	✓	✓		0.317 ± 0.003	0.696 ± 0.002	0.633 ± 0.020	0.702 ± 0.004	0.892 ± 0.003	0.662 ± 0.014
✓	✓	✓		0.352 ± 0.003	0.710 ± 0.001	0.642 ± 0.008	0.711 ± 0.005	0.896 ± 0.002	0.658 ± 0.015
✓	✓		✓	0.343 ± 0.004	0.699 ± 0.002	0.631 ± 0.007	0.659 ± 0.007	0.875 ± 0.003	0.648 ± 0.008
✓	✓	✓	✓	0.358 ± 0.007	0.712 ± 0.004	0.611 ± 0.007	0.693 ± 0.010	0.879 ± 0.004	0.646 ± 0.009
✓	✓	✓	✓	0.319 ± 0.003	0.695 ± 0.004	0.646 ± 0.007	0.696 ± 0.010	0.889 ± 0.005	0.643 ± 0.011
✓	✓	✓	✓	0.351 ± 0.005	0.710 ± 0.002	0.647 ± 0.011	0.694 ± 0.004	0.889 ± 0.003	0.657 ± 0.009
✓	✓	✓	✓	0.358 ± 0.003	0.714 ± 0.001	0.654 ± 0.004	0.734 ± 0.006	0.903 ± 0.001	0.680 ± 0.008

Table 3: Mean \pm STD results for pain and KLG prediction. The last row is our unified model, and all others are from the view-specific model. Our unified model not only allows for missing views but also boosts performance when using all available data. Incorporating more relevant views often leads to better predictions. Pelvis radiographs emerge as not very helpful. Further, cartilage thickness maps are not very helpful for pain prediction when knee radiographs are available.

D Additional Unified and Specific Model Comparison

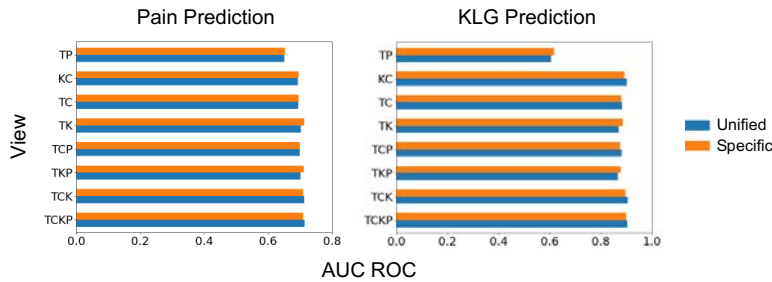


Fig. 5: Comparison between our unified model and view-specific model on AUC ROC. Similar to AP, our unified model performs on par with view-specific models but is slightly better when all views are used.