



Figure 6: Relationship between conformal uncertainty and two epistemic uncertainty measures at  $\alpha = 0.1$ ; colors correspond to different Fitzpatrick skin types;  $\times$  denotes a malignant skin condition and  $\circ$  denotes a non-malignant skin condition.

	<b>method</b>	0.1	0.2	0.3	0.4	0.5
softmax	NAIVE	0.71	0.75	0.78	0.75	0.55
	APS	0.69	0.72	0.75	0.78	0.82
	RAPS	0.69	0.73	0.75	0.79	0.82
	GAPS	0.66	0.70	0.74	0.76	0.80
	GRAPS	0.66	0.70	0.74	0.76	0.80
entropy	NAIVE	0.82	0.84	0.80	0.66	0.34
	APS	0.81	0.83	0.85	0.87	0.87
	RAPS	0.81	0.84	0.85	0.87	0.87
	GAPS	0.77	0.81	0.84	0.84	0.86
	GRAPS	0.77	0.81	0.84	0.84	0.86

Table 4: Spearman correlation between set size and epistemic uncertainty (maximum softmax probability and predictive entropy) at five different values of  $\alpha$ .

and darkest skin tones. Therefore, we conclude that group conformal methods can better describe subgroup uncertainty than regular conformal methods when subgroups come from different data distributions.

## Conclusion

Fair conformal predictors have the potential to increase clinician trust in AI models by providing meaningful notions of uncertainty across clinically relevant sub-populations. These distribution-free methods complement existing deep learning models and require no modifications to existing training procedures. Based on our experiments, we find group conformal predictors to be a promising and generally applicable approach to increasing clinical usability and trustworthiness in medical AI. We hope this work promotes further work into group conformal predictors for clinical applications in healthcare.

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