A   Supplementary Material

A.1   Additional Tables

Mimic Pairs	
Heliconius melpomene	**Heliconius erato**
malleti	lativitta
melpomene melpomene	hydara
plesseni	notabilis
vulcanus	venus
rosina	petiverana
cythera	cyrbia
nanna	phyllis
bellula	dignus
ecuadorensis	etylus
meriana	amalfreda

Table 3: Mimic Pairs

Acuity	1/cpd	Degrees
Male Behavioral Acuity	$\frac{1}{0.547}$	1.828
Male Morphological Acuity	$\frac{1}{0.386}$	2.591
Female Behavioral Acuity	$\frac{1}{0.428}$	2.336
Female Morphological Acuity	$\frac{1}{0.369}$	2.710
Kingfisher Acuity	$\frac{1}{26.0}$	0.038

Table 4: Acuity values used for image processing.
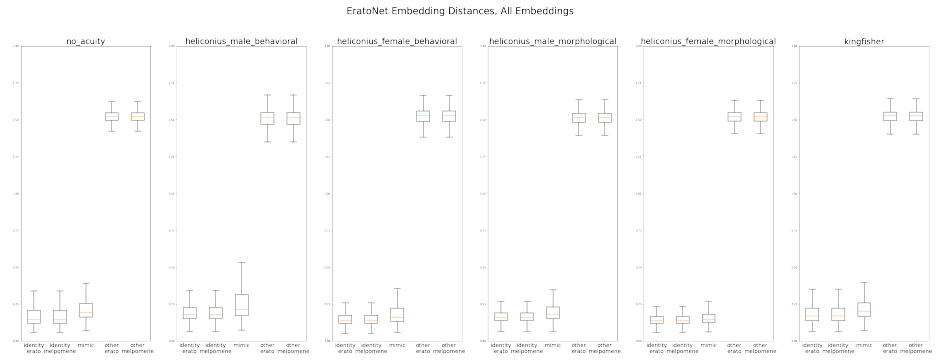
A.2   Additional Figures

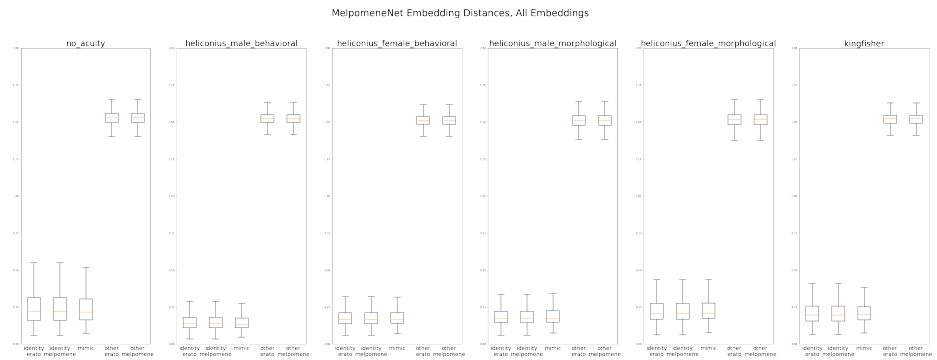**Fig. 4:** Pairwise euclidean distances between embeddings for Resnet50 trained on H. Erato subspecies only(Erato_Net).

Fig. 5: Pairwise euclidean distances between embeddings for Resnet50 trained on H.Melpomene subspecies only(Melpomene_Net).
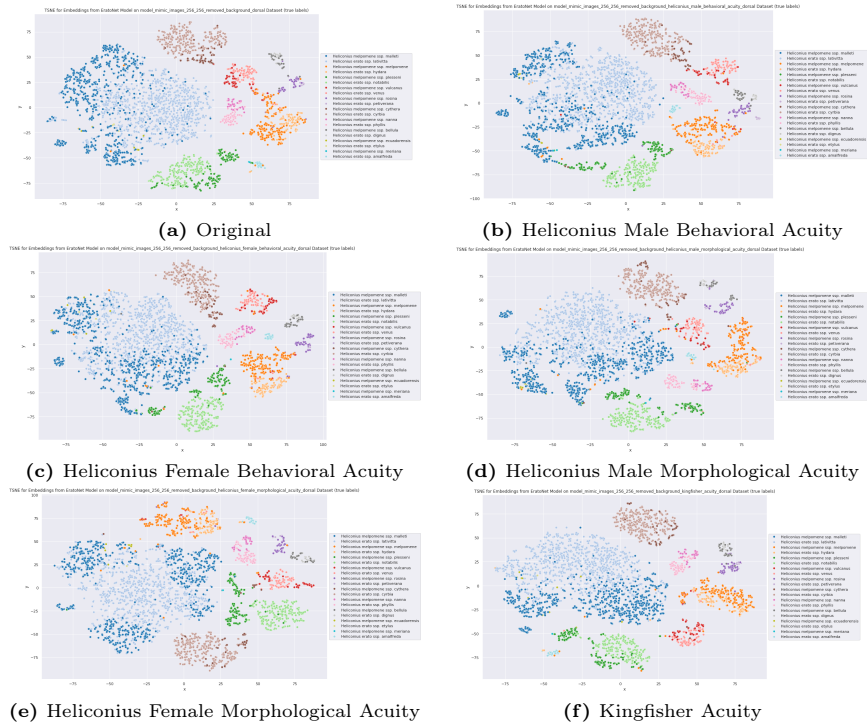
(a) Original

(b) Heliconius Male Behavioral Acuity

(c) Heliconius Female Behavioral Acuity

(d) Heliconius Male Morphological Acuity

(e) Heliconius Female Morphological Acuity

(f) Kingfisher Acuity

Fig. 6: T-SNE plots of image embeddings generated by EratoNet under different acuities.

(a) Original

(b) Heliconius Male Behavioral Acuity

(c) Heliconius Female Behavioral Acuity

(d) Heliconius Male Morphological Acuity

(e) Heliconius Female Morphological Acuity
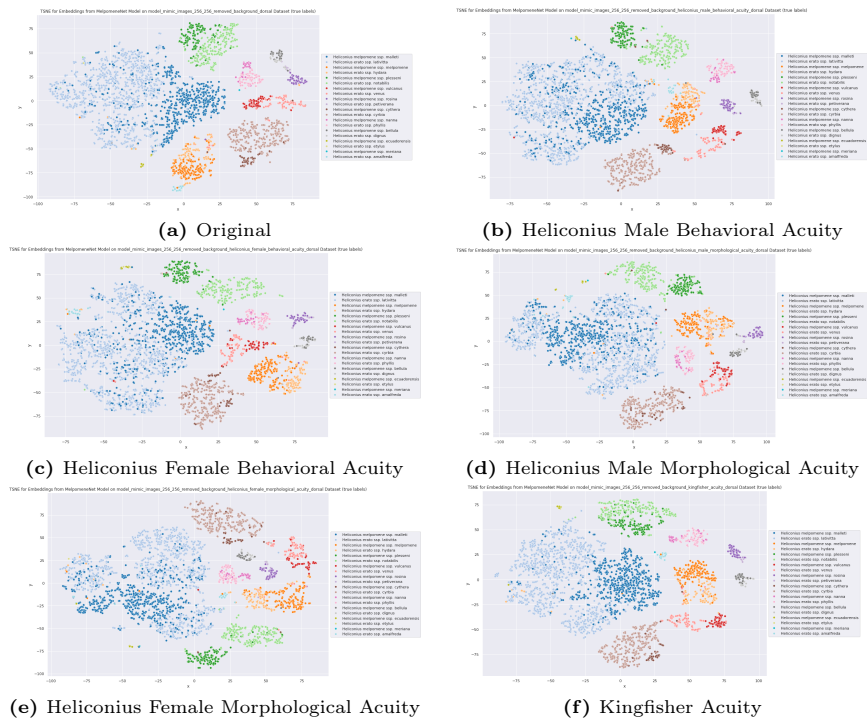
(f) Kingfisher Acuity

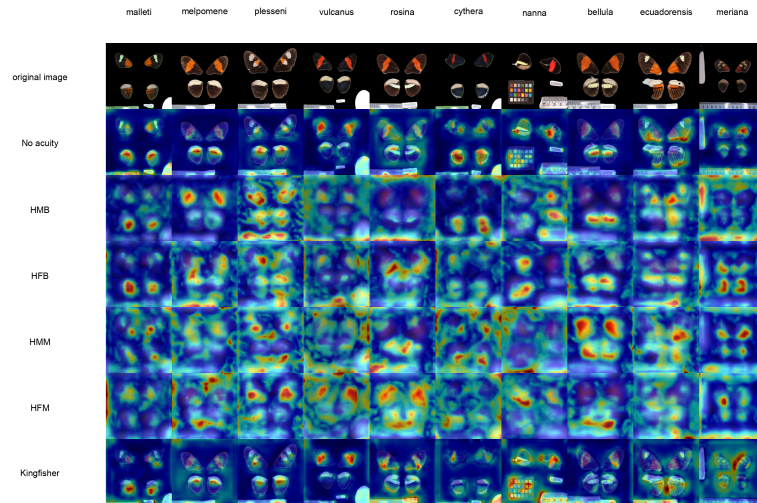**Fig. 7:** T-SNE plots of image embeddings generated by MelpomeneNet under different acuities.

Fig. 8: GradCAM results from AllNet on H. melpomene subspecies (top row) across no acuity, heliconius male behavioral acuity (HMB), heliconius female behavioral acuity (HFB), heliconius male morphological acuity (HMM), heliconius female morphological acuity (HFM), and kingfisher acuity.
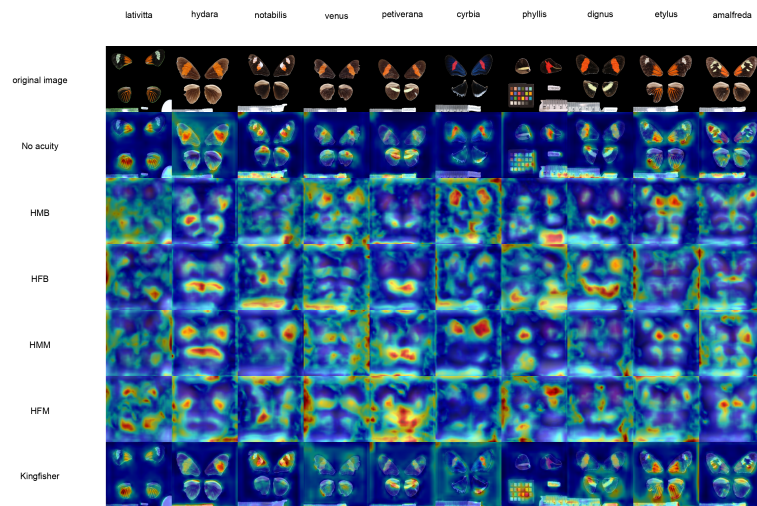

Fig. 9: Gradcam results from AllNet on H. erato subspecies (top row) across no acuity, heliconius male behavioral acuity (HMB), heliconius female behavioral acuity (HFB), heliconius male morphological acuity (HMM), heliconius female morphological acuity (HFM), and kingfisher acuity.
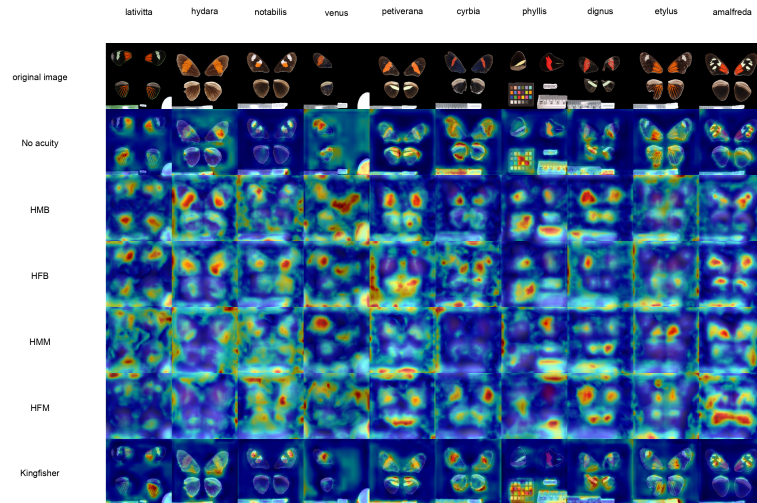
Fig. 10: Gradcam results from EratoNet on H. erato subspecies (top row) across no acuity, heliconius male behavioral acuity (HMB), heliconius female behavioral acuity (HFB), heliconius male morphological acuity (HMM), heliconius female morphological acuity (HFM), and kingfisher acuity.
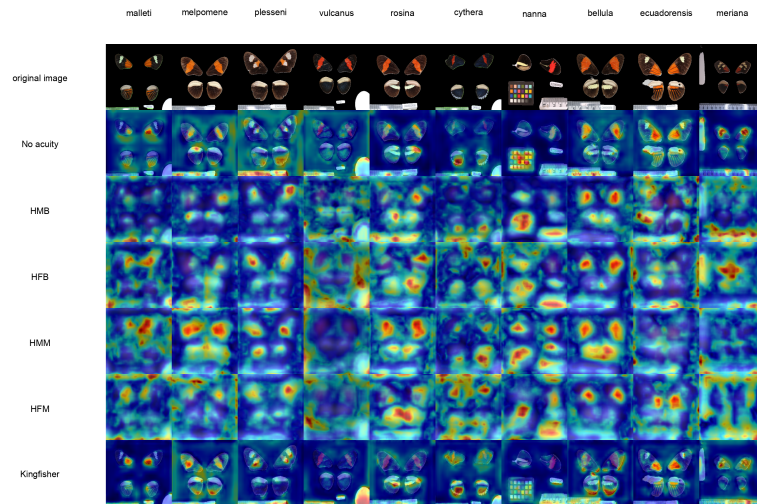

Fig. 11: Gradcam results from EratoNet on H. melpomene subspecies (top row) across no acuity, heliconius male behavioral acuity (HMB), heliconius female behavioral acuity (HFB), heliconius male morphological acuity (HMM), heliconius female morphological acuity (HFM), and kingfisher acuity.
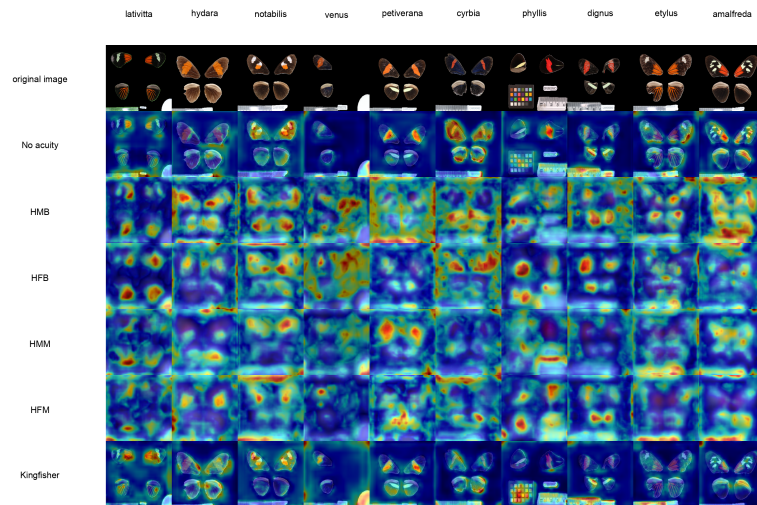
Fig. 12: Gradcam results from MelpomeneNet on H. erato subspecies (top row) across no acuity, heliconius male behavioral acuity (HMB), heliconius female behavioral acuity (HFB), heliconius male morphological acuity (HMM), heliconius female morphological acuity (HFM), and kingfisher acuity.
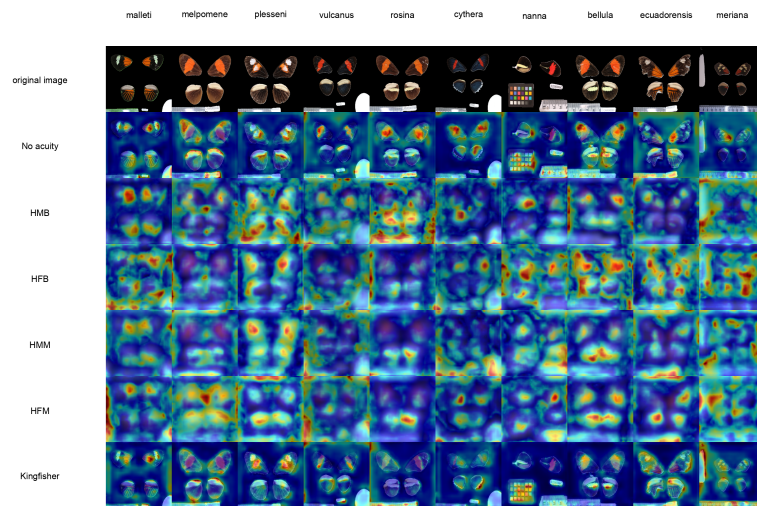

Fig. 13: Gradcam results from MelpomeneNet on H. melpomene subspecies (top row) across no acuity, heliconius male behavioral acuity (HMB), heliconius female behavioral acuity (HFB), heliconius male morphological acuity (HMM), heliconius female morphological acuity (HFM), and kingfisher acuity.