

Dragon Birds and Dinosaurs

Lianna Xie

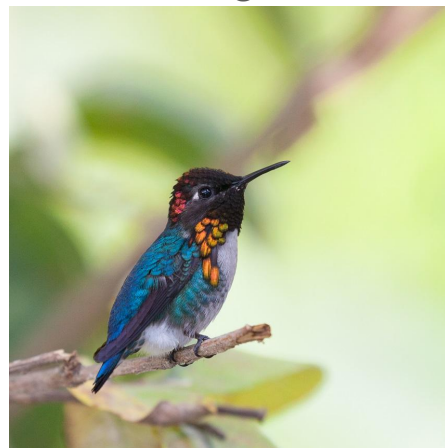
Dimetrodon



Stegosaur



Hummingbird







What once was...

They now make up the clade Strisores,
instead of the order Caprimulgiformes



Species2	Family2	Order2	Avibase_ID2	Total_Index	Fea	M	Unk	Contest	Beak_Leng	Beak_Leng	Beak_Wi	Beak_De	Tarsus_L	Wing_L	Kipps_Dist	Secund	Hand	Tail_Len	Mass	Mass_Score	Mass_Netf_Oth	Index		
10040	Trogonidae	Trogoniformes	AVIBASE-020510E3	9	4	5	0	8.0	24.0	13.4	8.9	10.2	17.6	138.4	70.1	108.3	39.3	161.2	163.0		Dunning	NA	NO	
10041	Trogonidae	Trogoniformes	AVIBASE-020603A4	4	2	2	0	4.0	18.1	20.4	8.0	9.1	17.9	132.5	49.2	83.3	37.1	158.2	74.2		Dunning	NA	NO	
10042	Trogonidae	Trogoniformes	AVIBASE-07000758	5	1	2	2	4.0	18.6	20.8	7.3	8.5	18.3	123.2	44.6	76.3	36.9	124.8	53.4		Dunning	NA	NO	
10043	Trogonidae	Trogoniformes	AVIBASE-07101395	4	2	2	0	4.0	24.3	16.0	9.6	12.2	13.6	147.5	33.6	93.9	36.4	153.0	36.4		Dunning	NA	NO	
10044	Trogonidae	Trogoniformes	AVIBASE-08141523	14	7	7	0	4.0	17.8	11.4	8.8	10.8	119.2	45.2	71.6	17.8	105.3	43.0		Updated, Literature		Dunning (2021)	NO	
10045	Trogonidae	Trogoniformes	AVIBASE-02040279	5	2	3	0	4.0	24.1	14.6	10.9	10.8	14.9	136.2	46.9	85.9	35.3	145.0	89.7		Dunning	NA	NO	
10046	Trogonidae	Trogoniformes	AVIBASE-08141523	7	2	4	1	4.0	20.6	13.4	8.2	10.1	15.5	186.4	48.4	87.8	35.5	159.6	79.0		Dunning	NA	NO	
10047	Trogonidae	Trogoniformes	AVIBASE-07101395	4	1	3	0	4.0	24.0	15.2	10.6	12.7	15.9	160.0	39.5	100.6	37.1	169.8	130.0		Dunning	NA	NO	
10048	Trogonidae	Trogoniformes	AVIBASE-04101402	10	8	11	0	8.0	20.3	11.2	8.2	9.1	13.4	121.2	46.3	74.2	36.4	137.7	65.4		Dunning	NA	NO	
10049	Trogonidae	Trogoniformes	AVIBASE-04101402	4	2	2	0	4.0	25.2	16.2	9.8	13.4	14.8	153.6	53.4	102.2	33.4	151.0	114.0		Dunning	NA	NO	
10050	Trogonidae	Trogoniformes	AVIBASE-07051412	20	9	10	1	8.0	19.7	11.2	8.8	9.4	12.4	122.4	44.3	78.4	36.1	139.0	54.0		Dunning	NA	NO	
10051	Trogonidae	Trogoniformes	AVIBASE-07051412	9	4	4	1	8.0	19.6	12.3	9.1	9.9	14.6	130.7	51.7	79.0	39.5	160.6	70.9		Dunning	NA	NO	
10052	Trogonidae	Trogoniformes	AVIBASE-07051412	4	2	2	0	4.0	28.1	17.4	8.8	11.4	17.2	174.0	62.8	111.2	36.1	254.1	145.0		Dunning	NA	NO	
10053	Trogonidae	Trogoniformes	AVIBASE-07101395	5	2	3	0	4.0	21.0	13.8	8.8	11.4	14.2	143.7	51.4	95.0	39.6	144.0	85.1		Dunning	NA	NO	
10054	Trogonidae	Trogoniformes	AVIBASE-02031744	12	5	7	0	8.0	24.8	15.5	10.2	10.2	14.0	153.5	54.1	100.6	35.0	150.1	114.0		Dunning	NA	NO	
10055	Trogonidae	Trogoniformes	AVIBASE-04021078	5	2	3	0	4.0	24.4	14.5	10.3	11.9	15.4	153.0	48.8	104.8	31.7	155.5	114.0		Dunning	NA	NO	
10056	Trogonidae	Trogoniformes	AVIBASE-07020782	5	2	3	0	4.0	20.0	11.4	9.8	9.8	14.8	147.6	60.3	86.7	43.0	180.6	71.0		Dunning	NA	NO	
10057	Trogonidae	Trogoniformes	AVIBASE-02100488	23	12	10	1	8.0	18.9	11.7	8.5	8.9	14.3	125.7	46.9	78.3	37.5	157.8	61.4		Dunning	NA	NO	
10058	Trogonidae	Trogoniformes	AVIBASE-09020241	10	4	6	0	8.0	19.4	11.0	10.4	8.6	11.7	115.5	42.0	73.5	36.4	122.7	43.4		Updated, Literature		Dunning (2021)	NO
10059	Trogonidae	Trogoniformes	AVIBASE-03041511	22	10	12	0	8.0	19.9	11.7	8.9	9.8	13.1	115.1	45.8	70.3	37.9	140.9	53.8		Dunning	NA	NO	
10060	Trogonidae	Trogoniformes	AVIBASE-10101193	8	4	4	0	8.0	19.5	11.8	9.3	9.9	15.3	139.2	51.2	82.0	38.4	152.7	73.3		Dunning	NA	NO	
10061	Trogonidae	Trogoniformes	AVIBASE-06031510	4	0	4	1	4.0	19.0	11.4	9.0	9.4	10.8	114.0	41.7	76.3	36.4	104.0	46.5		Dunning	NA	NO	
10062	Trogonidae	Trogoniformes	AVIBASE-04070910	16	7	8	1	8.0	25.2	15.0	10.1	11.7	14.2	146.1	50.6	95.6	34.6	158.4	89.7		Dunning	NA	NO	
10063																								

Data!

AVONET e-bird dataset

Traits:

column_name datatype n

0	Family2	object
1	Beak_Length_Culmen	float64
2	Beak_Length_Nares	float64
3	Beak_Width	float64
4	Beak_Depth	float64
5	Tarsus_Length	float64
6	Wing_Length	float64
7	Kipps_Distance	float64
8	Secondary1	float64
9	Hand-Wing_Index	float64
10	Tail_Length	float64
11	Mass	float64



House Finch

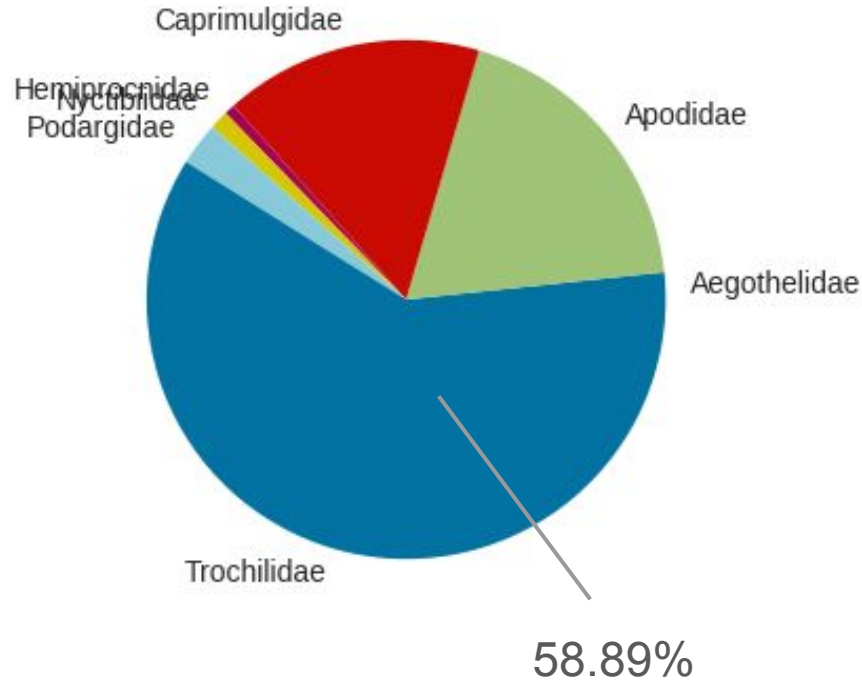
(scary)

Just the
Caprimulgiformes

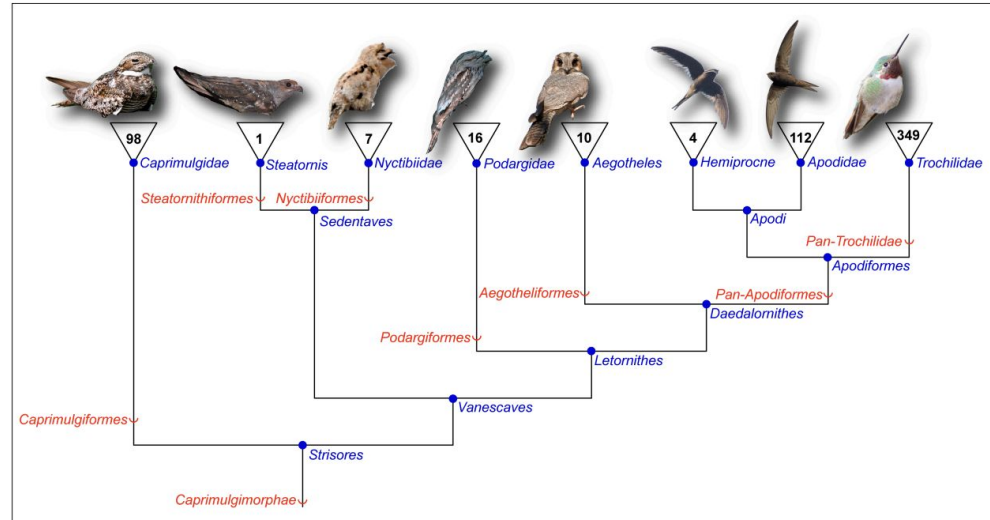
(less scary)

38	587	Threnetes ruc	Trochilidae	Caprimulgifon	AVIBASE-DDC
39	588	Tilmatura dup	Trochilidae	Caprimulgifon	AVIBASE-8BD
40	589	Topaza pella	Trochilidae	Caprimulgifon	AVIBASE-9F2
41	590	Topaza pyra	Trochilidae	Caprimulgifon	AVIBASE-66D
42	591	Trochilus poly	Trochilidae	Caprimulgifon	AVIBASE-6CC
43	592	Uranomitra fr	Trochilidae	Caprimulgifon	AVIBASE-3FF
44	593	Urochroa bou	Trochilidae	Caprimulgifon	AVIBASE-34C
45	594	Urochroa leuc	Trochilidae	Caprimulgifon	AVIBASE-41B
46	595	Urosticte benj	Trochilidae	Caprimulgifon	AVIBASE-AE7
47	596	Urosticte rufic	Trochilidae	Caprimulgifon	AVIBASE-C43
48					
49					

A few more interesting facts

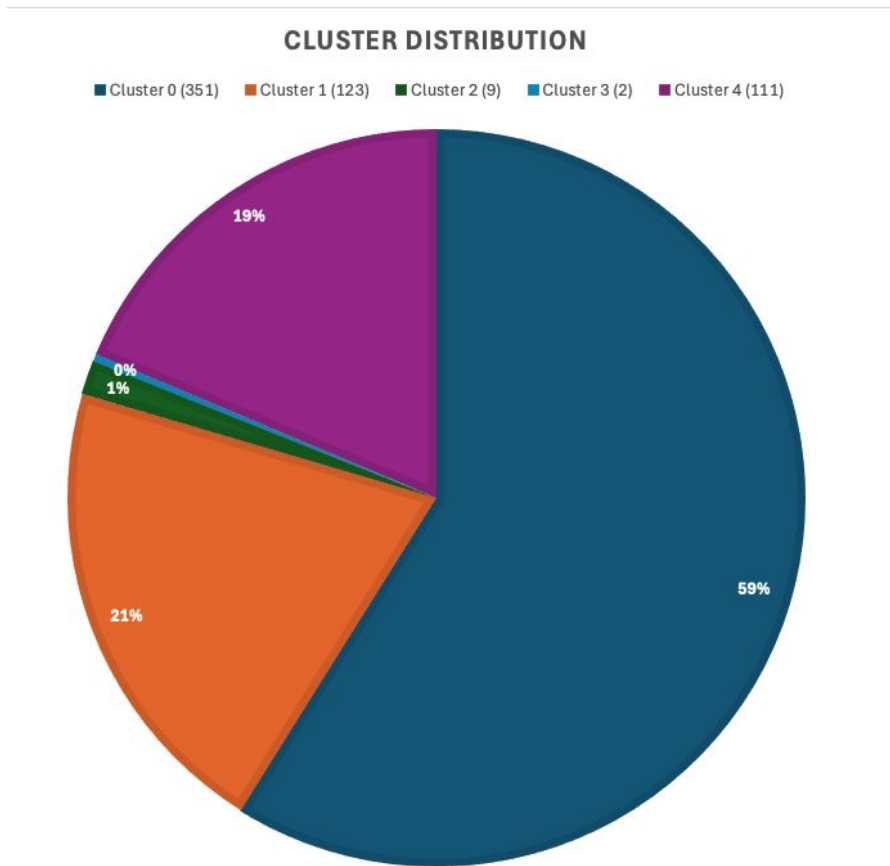


Steatornidae



Before normalizing the data

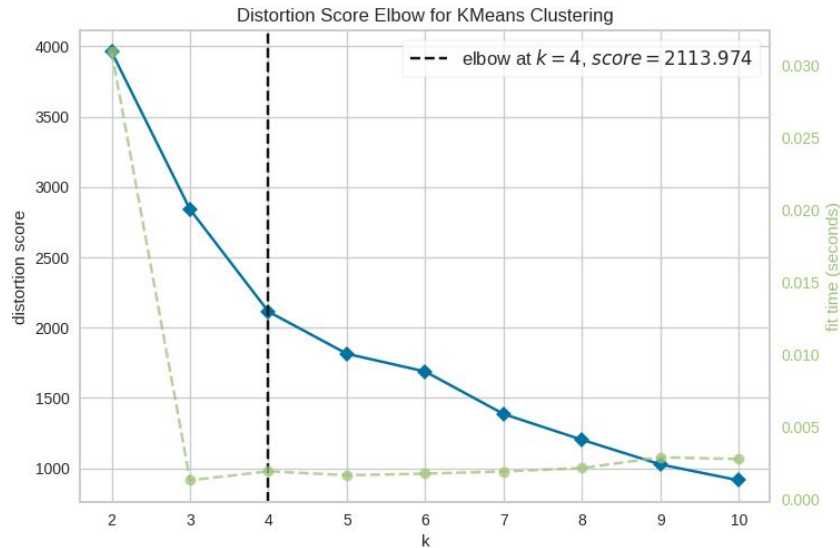
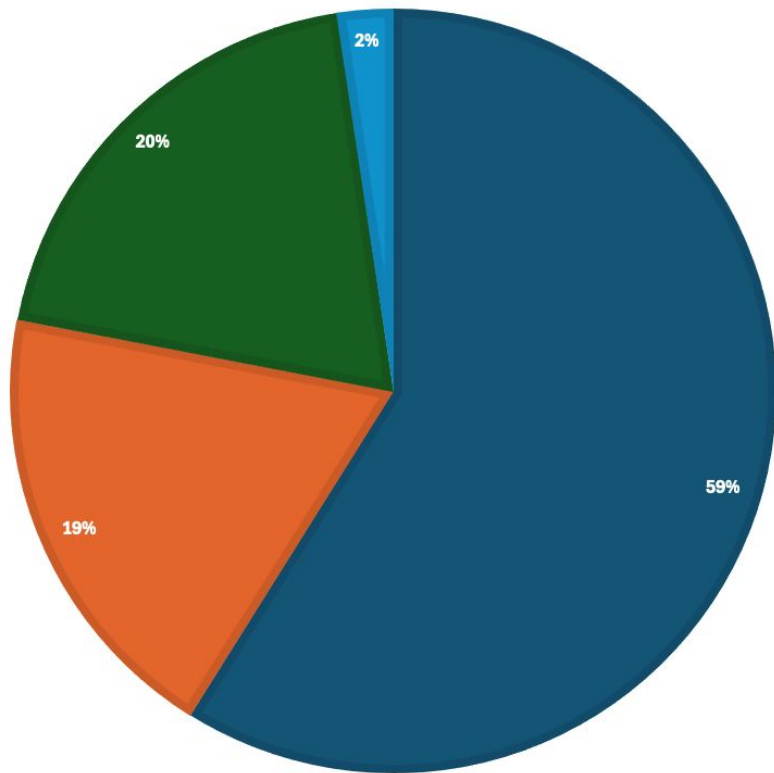
Species	Family	Tail_Length
Uropsalis lyra	Caprimulgidae	685.2
Macropsalis forcipata	Caprimulgidae	658
Uropsalis segmentata	Caprimulgidae	344.4
Hydropsalis torquata	Caprimulgidae	337.4
Nyctibius aethereus	Nyctibiidae	301.2



After normalizing the data

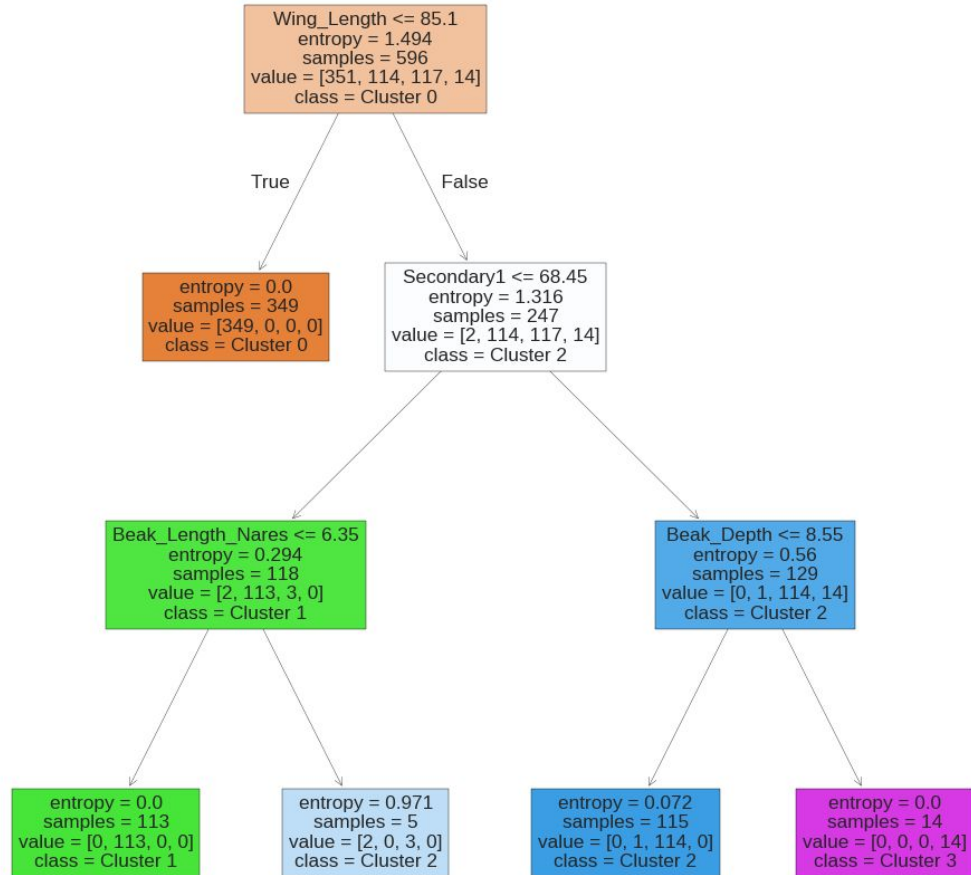
CLUSTER DISTRIBUTION

Cluster 0 (351) Cluster 1 (114) Cluster 2 (117) Cluster 3 (14)

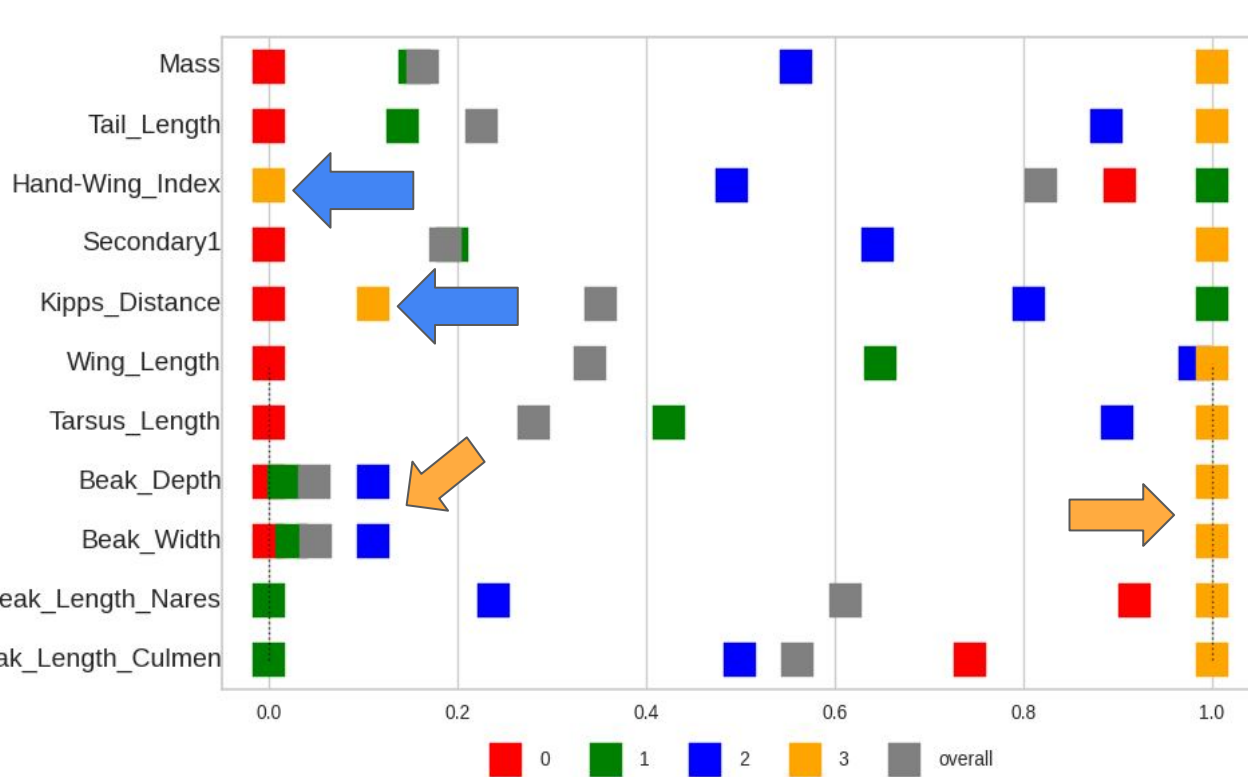


Clustering Results

Family	Cluster Assignment
Trochilidae	Cluster 0
Hemiprocnidae	Cluster 1
Aegothelidae	Cluster 2
Nyctibiidae	
Apodidae	Mostly Cluster 2
Caprimulgidae	
Podargidae	Mostly Cluster 3



The outlier cluster and frogmouths



0: hummingbirds; 1: swifts; 2: varied; 3: frogmouths

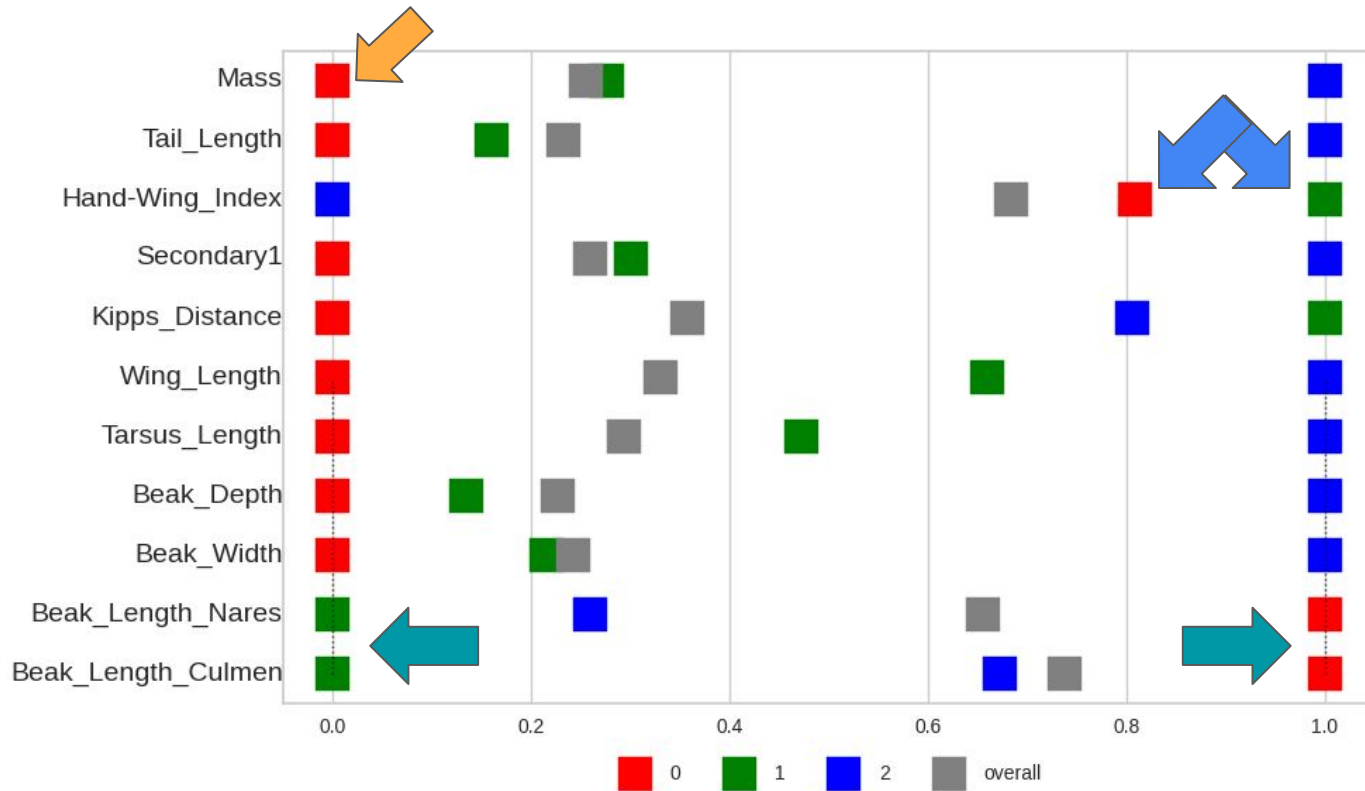


Attention to the
Sumatran, Bornean,
Hodgson's frogmouths



Papuan
frogmouth for
comparison

Hummingbirds and treeswifts



Sword-billed hummingbird



0: hummingbirds; 1: treeswifts; 2: varied

