

Content-based Image Retrieval for Biodiversity: A Comparative Study

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Introduction

Could you find me a jaguar!

Yes! This one?

No!

How about this one?

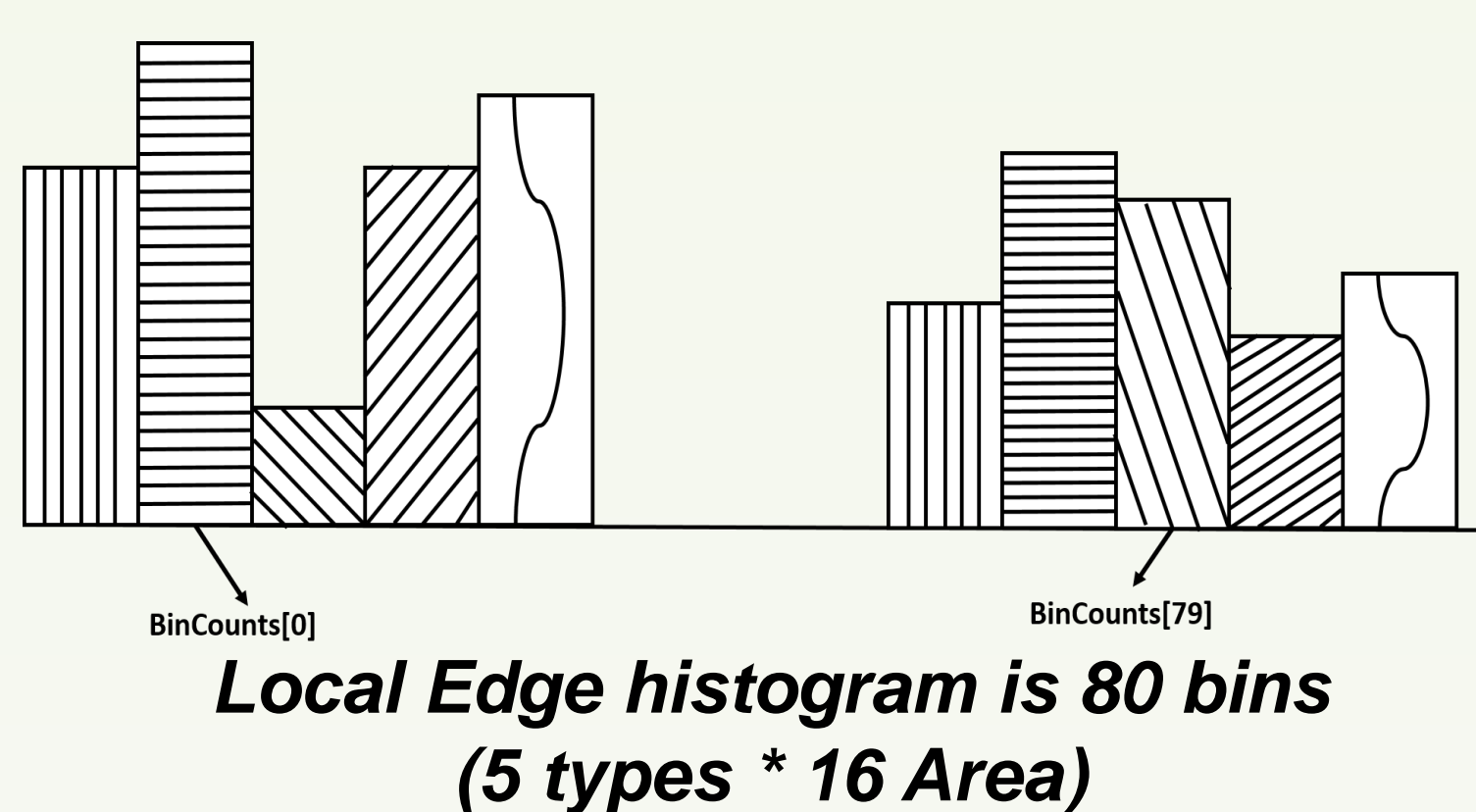
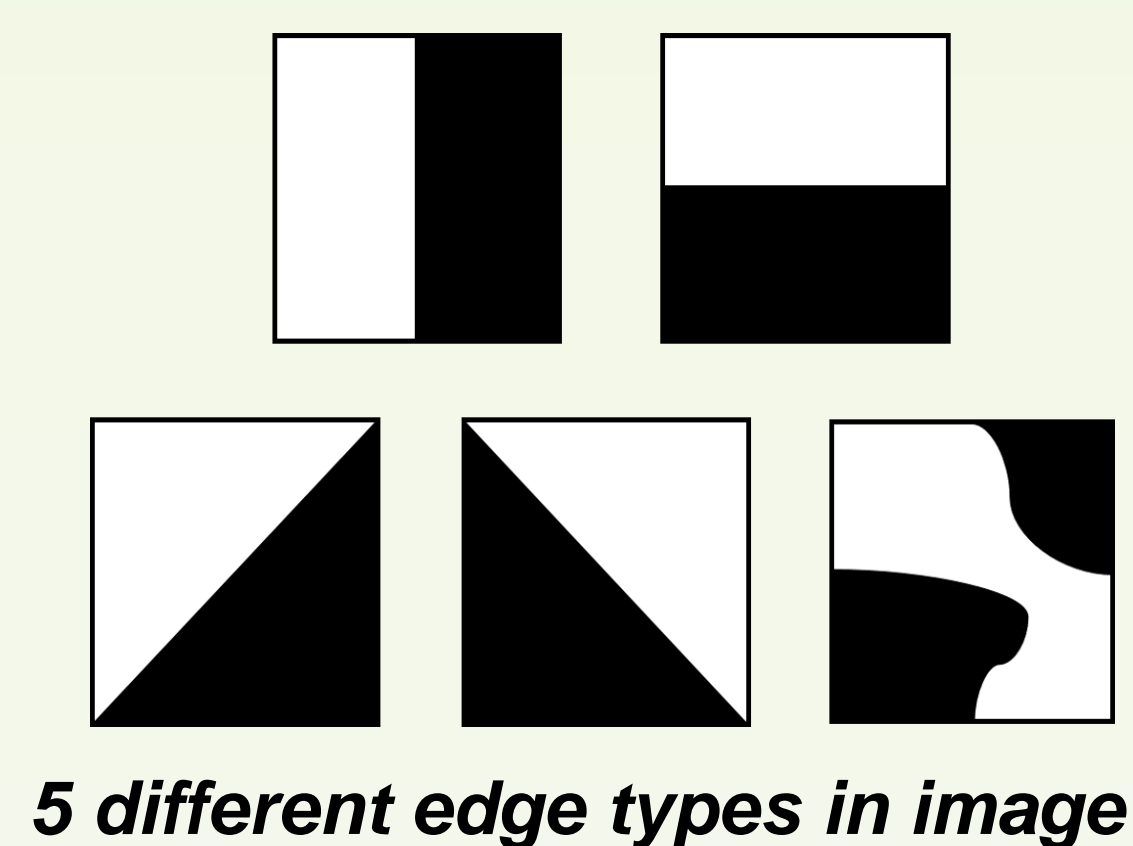
No!!

Could You show me a sample?

Yes

He didn't even mention A CAR!

Edge Feature

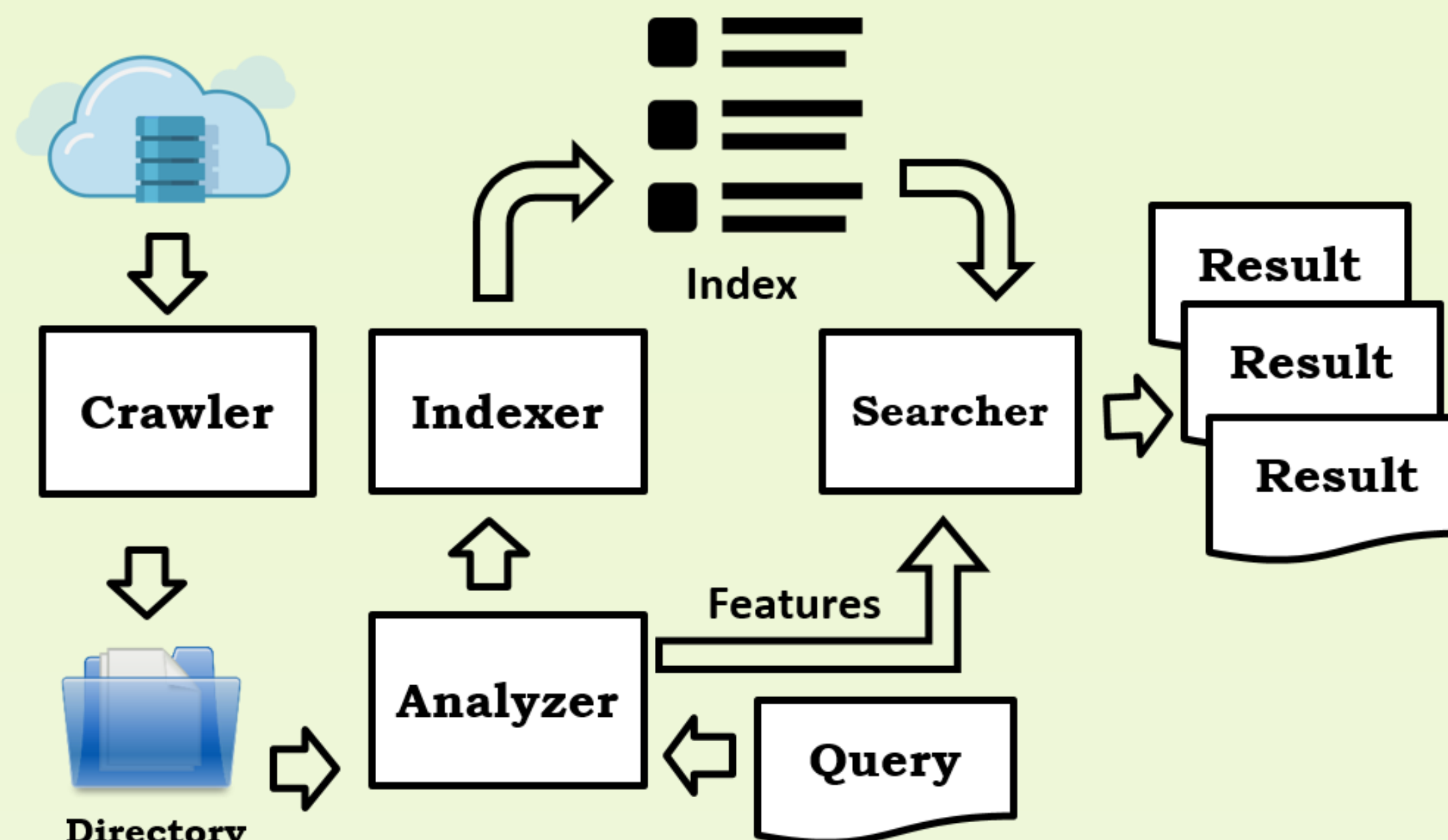


- The global and semi-global edge histograms (5 and 65 bins)
- Combining (Local + Global + Semi-global) histograms = 150 bin histogram

- Distance measure [1]:

$$D(A, B) = \sum_{k=0}^{79} |Local_{A[i]} - Local_{B[i]}| + 5 \times \sum_{k=0}^4 |Global_{A[i]} - Global_{B[i]}| + \sum_{k=0}^{64} |Semi_Global_{A[i]} - Semi_Global_{B[i]}|$$

CBIR Block Diagram



Tools

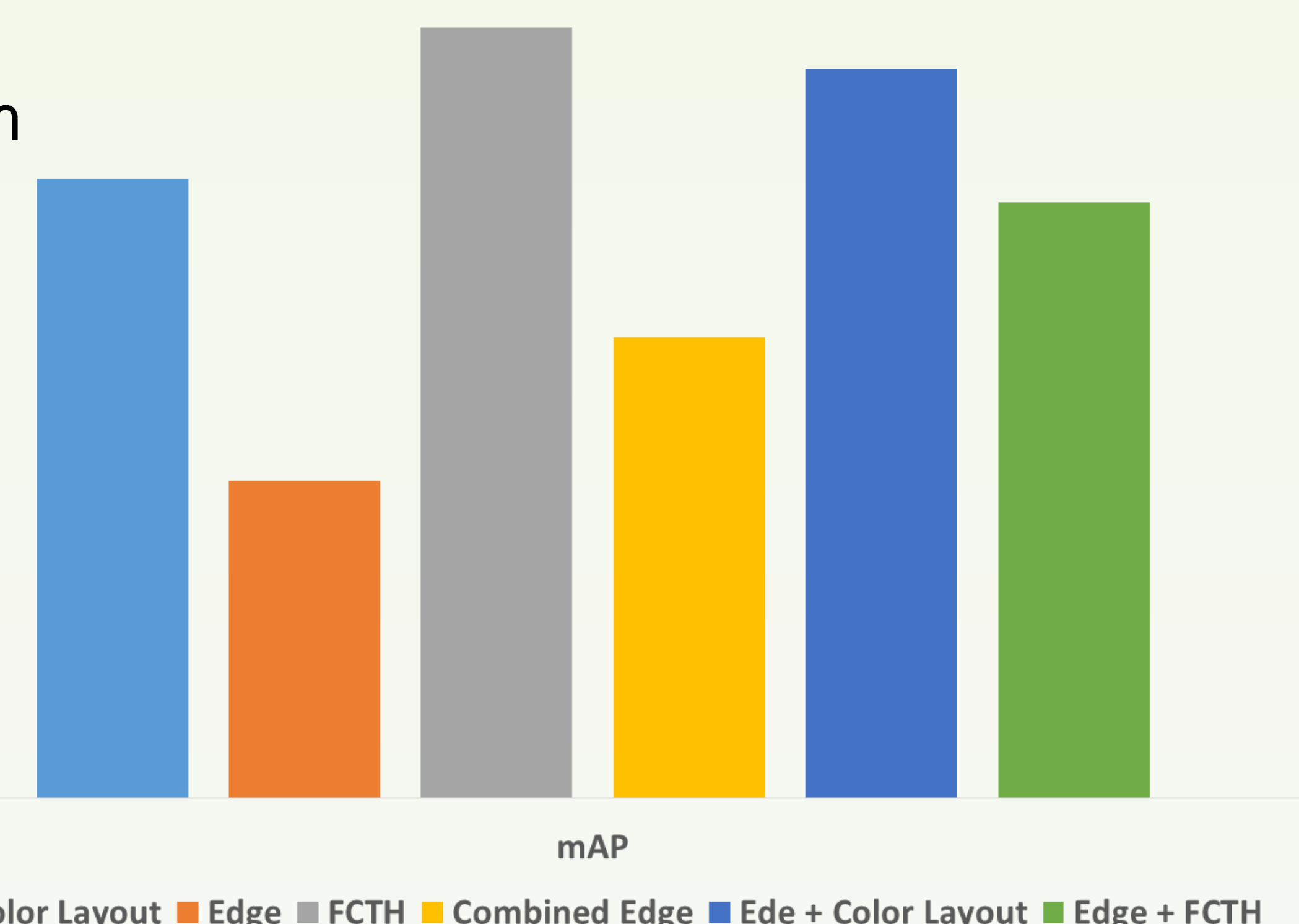


Dataset

Synset	Id	#Images	Sample
Animal Planet flora,	n00015388	400	
planet life	n00017222	400	
Owl	n01621127	100	
Elephant	n02503517	100	

Experimental Evaluation

- Image Features
 - Fuzzy Color Texture Histogram (FCTH)
 - Color layout (CLD)
 - Edge Histogram
 - Combined Edges (CE)
 - CE + CLD
 - CE + FCTH
- Dataset size = 1000 image
- 13 different queries
- Results evaluated by 10 users



Conclusion

- Combined features have better semantic meaning than single ones.
- Semantic gap still exists
- (Future Work)** Machine learning techniques to limit search scope:
 - Clustering & Classification

References

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