

# An Efficient Way of Animal Detection using Single Shot Multibox Detector Algorithm over K-MEANS Clustering for Improvement in Detection

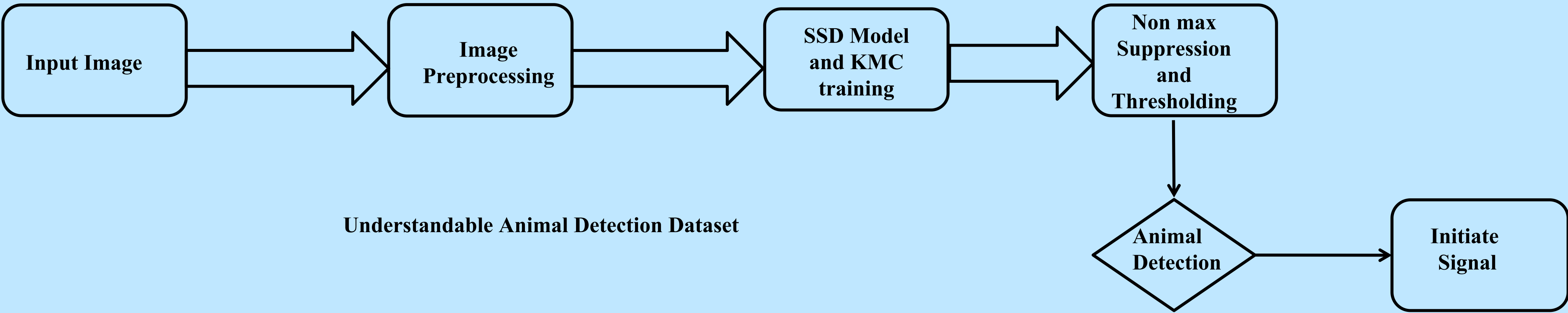
## INTRODUCTION

- This study endeavors to explore an effective method for enhancing animal detection accuracy by leveraging the SSD algorithm in conjunction with K-Means clustering techniques
- Current approaches to animal detection often encounter challenges related to accuracy and efficiency, limiting their utility in practical scenarios such as wildlife monitoring projects and conservation initiatives
- By integrating the SSD algorithm with K-Means clustering, this study aims to address the shortcomings of existing animal detection methods, offering a more precise and efficient solution for identifying animals within images
- Enhancing animal detection methods' accuracy is essential for promoting conservation efforts for animals, supporting species monitoring, and enabling ecological study to save biodiversity
- A dataset comprising 10,000 annotated wildlife images with 20 iterations, employed to train and compare SSD and K-MEANS Clustering algorithms for enhanced animal detection accuracy



Fig. 1 Cow Detection in Farm

## MATERIALS AND METHODS



## RESULTS

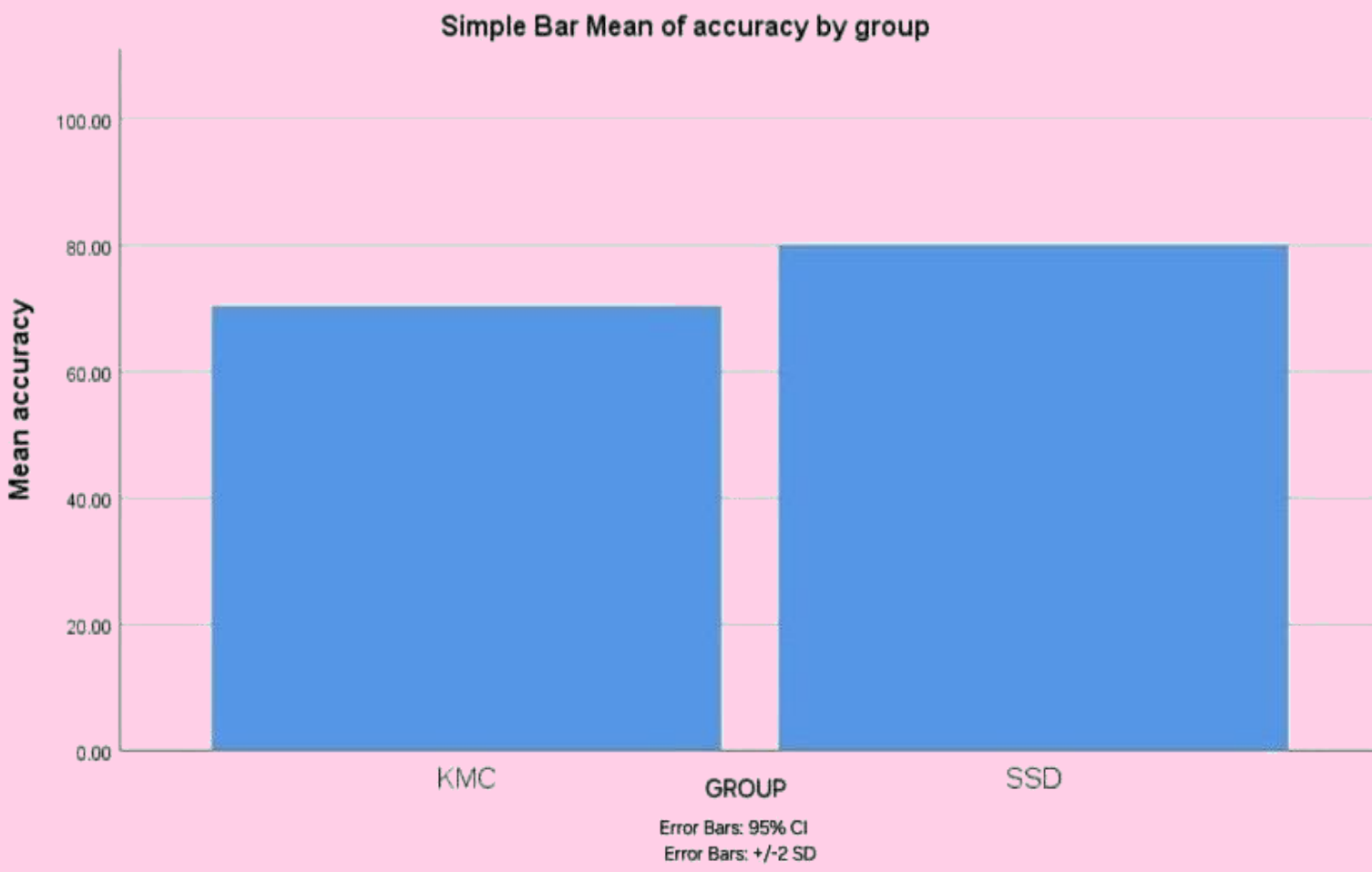


Fig. 2 Bar Graph showing the comparison of the mean accuracy of Animal Detection with SSD and KMC

Table 1: The independent sample t-test has a significant value  $p=0.001(p<0.05)$  indicating the study between the SSD and the KMC is statistically significant

	Independent Sample t-test								
	Levene’s Test for Equality of Variances					t-test for Equality of Means			
	F	Sig	t	df	Sig(2-tailed)	MeanDiffer ence	Std. Error Difference	95% ConfidenceInterval of theDifference	
Equal variances assumed	4.478	0.041	17.485	38	0.000	9.65000	0.55191	8.53272	10.76728
Equal variances not assumed			17.485	35.630	0.000	9.65000	0.55191	8.53027	10.76973

## DISCUSSION AND CONCLUSION

- Based on t-test Statistical analysis, the significance value of  $p = 0.001$  (independent sample t - test  $p<0.05$ ) is obtained and shows that there is a statistical significant difference between the KMC and SSD
- Overall , the accuracy of the SSD is 80 % and it is better than KMC which has up to 70%
- The group statics reveal that SSD with a standard deviation of 1.5035, whereas KMC with standard deviation of 1.95744
- Animal Detection using SSD and KMC algorithms shows promise for improving accuracy and efficiency, SSD provides speed and simplicity, while KMC excels at managing complexity, These developments might lead to earlier Animal Detection
- In colusion, the development of models adept at learning future dependencies could offer significant benefits across diverse domains, including artificial intelligence, These models could excel in tasks such as detecting and quantifying desolation dependencies

## BIBLIOGRAPHY

- Francis Williams; Ludmila I. Kuncheva; Juan J. Rodríguez;Samuel L Hennessey.Combination of Object Tracking and Object Detection for Animal Recognition(2022)Published In:ieeexplore.ieee.org(10052787),DOI:10.1109/IPAS55744.2022.10053017
- Normaisharah Mamat; Mohd Fauzi Othman; Fitri Yakub,Animal Intrusion Detection in Farming Area using YOLOv5 Approach(2022).Published In:ieeexplore.ieee.org(10003266), DOI:10.23919/ICCAS55662.2022.10003780
- Anuvind P E; Abhishek C K; Mohamed Shibili; Rahila C K; Neethu K ,Development and Implementation of an Animal Intrusion Detection System Using Image and Audio Processing(2023).Published In: ieeexplore.ieee.org(10306338), DOI:10 1109/ICCCNT56998.2023.10307574
- Keigo UCHIYAMA; Hiroshi YAMAMOTO.Power-saving Sensor Network System for Detection of Harmful Animals by Step-by-step Sensor Linkage(2023).Published In:ieeexplore.ieee.(10043349), DOI:10.1109/ICCE56470.2023.10043464