

IMAGE COMPRESSION ALGORITHMS FOR PROCESS OPTIMIZATION IN LIVESTOCK FARMING PRECISION

Team Presentation



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<https://github.com/dgonzalezi/ST0245-003/tree/master/proyecto>



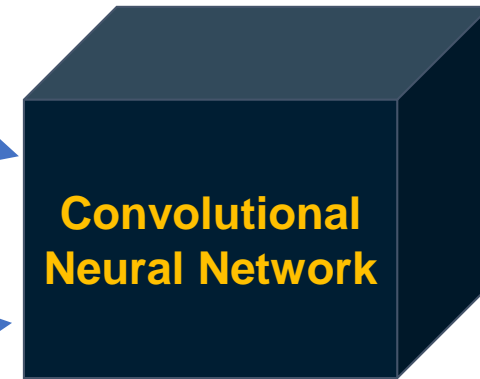
Training Process



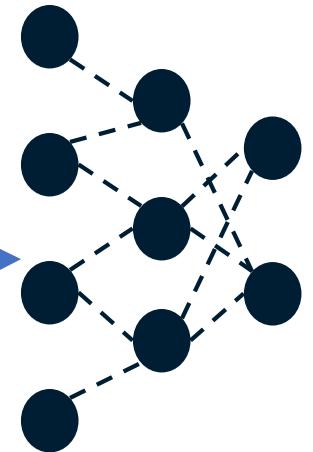
Sick-Cattle Images



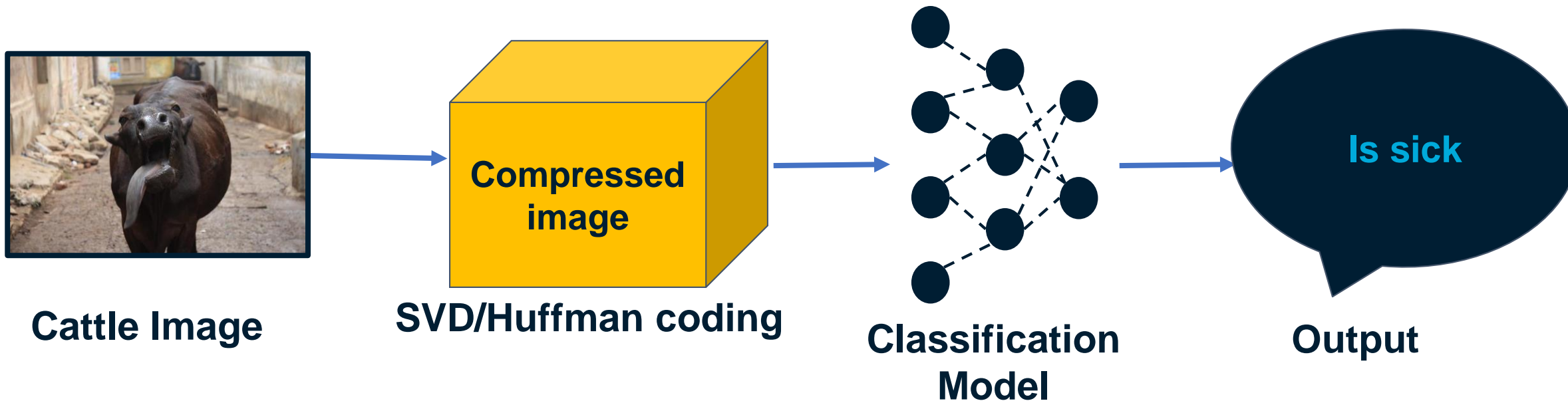
Healthy-Cattle Images



**Classification
Algorithm**



**Classification
Model**



Compression Algorithm Design: Singular Value Decomposition

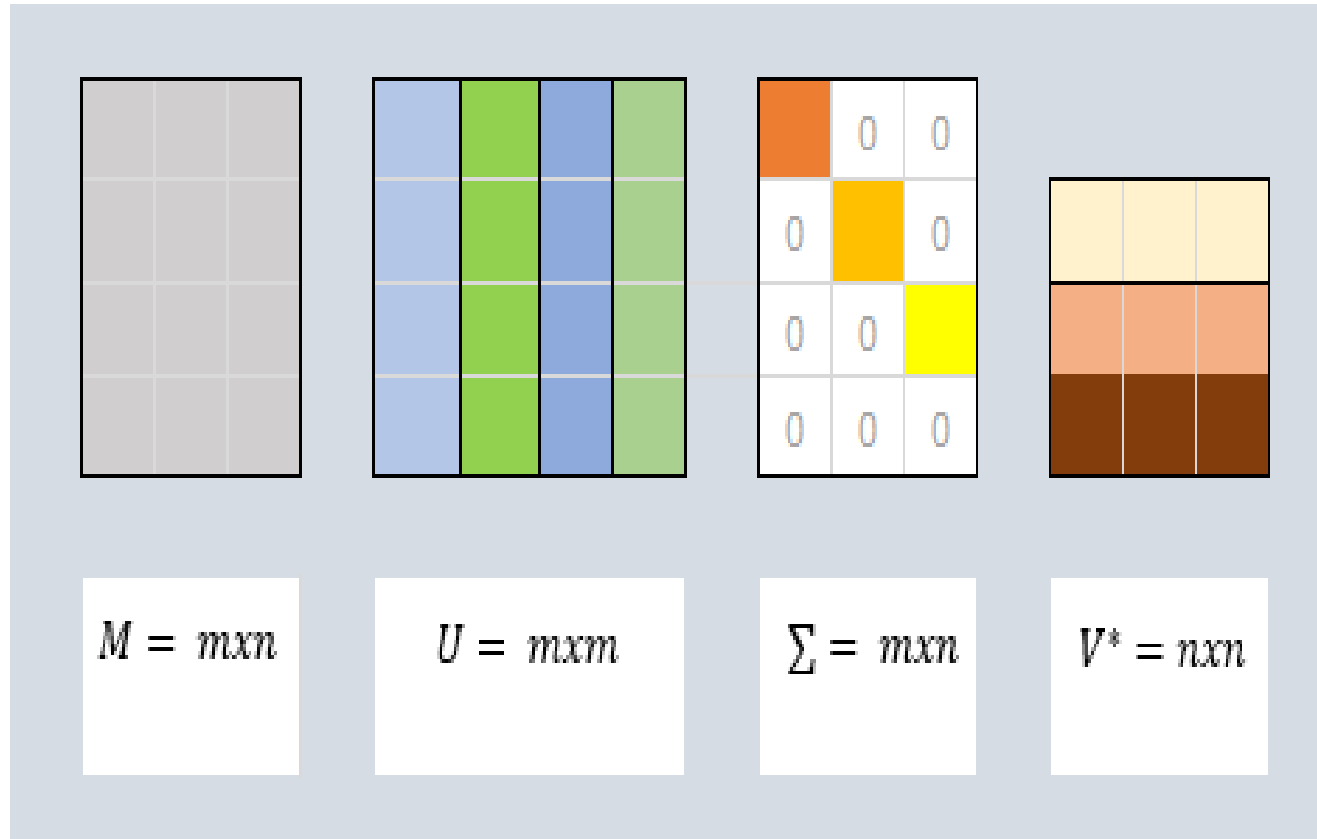
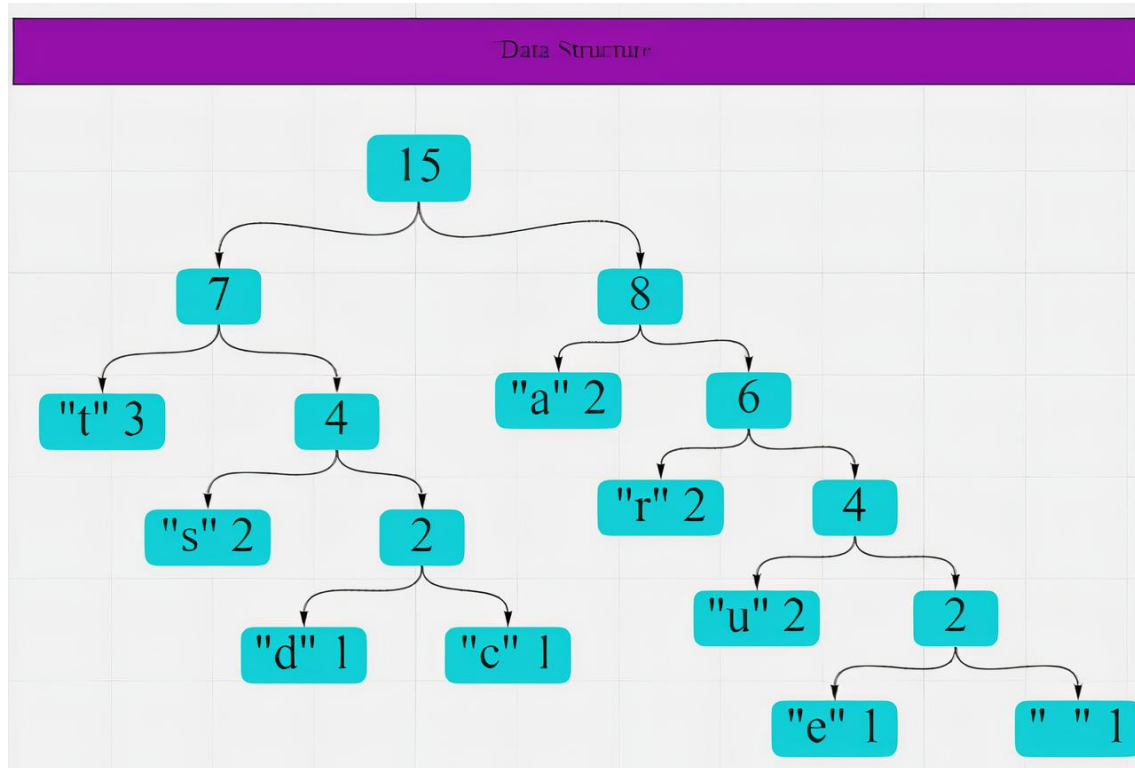


Photo by [Wolfgang Hasselmann](#) on [Unsplash](#)

Compression Algorithm Design: Huffman Coding



The binary tree is a data structure which is composed of root, branch and leaf, in which each node can have one left and one right child.



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Compression Algorithm Design: Huffman Coding



Huffman Tree from the string “Data Structure”

Character	d	a	t	s	r
Frequency	1	2	3	2	2

Character	u	c	e	" "	Total
Frequency	2	1	1	1	15

Huffman coding is implemented by constructing a binary tree of nodes from a list of nodes, whose size depends on the number of symbols n . The nodes contain two fields, the symbol and the weight.



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Compression Algorithm Complexity



SVD	Time Complexity
Image compression	$O(N)$
Image decompression	$O(N)$

Time complexity of the SVD algorithm. N is the width of the matrix and M represents the length of the image matrix.

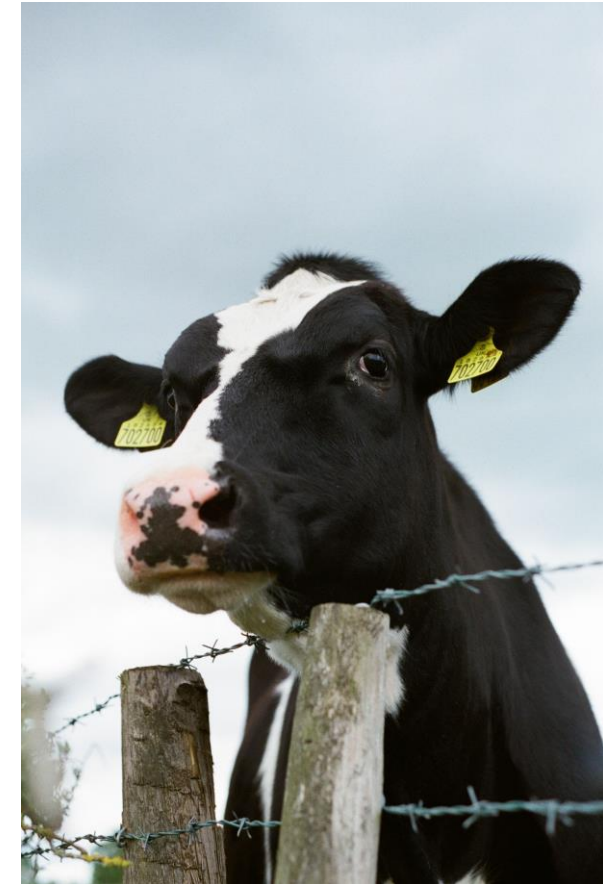


Photo by [Jakob Cotton](#) on [Unsplash](#)

Compression Algorithm Complexity



Huffman	Time Complexity	Time	
Image compression	$O(N*M)$	0.7333s	
Image decompression	$O(N)$	0.574s	

Time complexity of the Huffman algorithm. N is the width of the matrix and M represents the length of the image matrix.

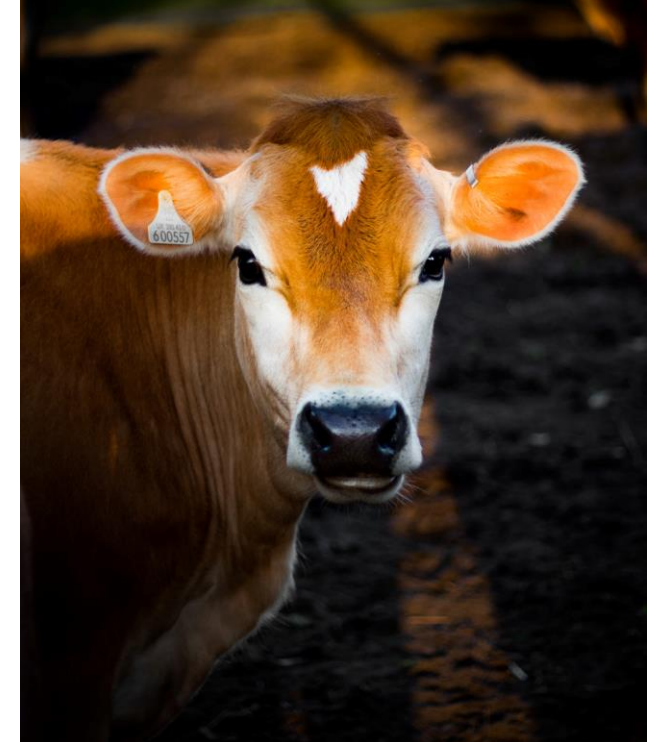
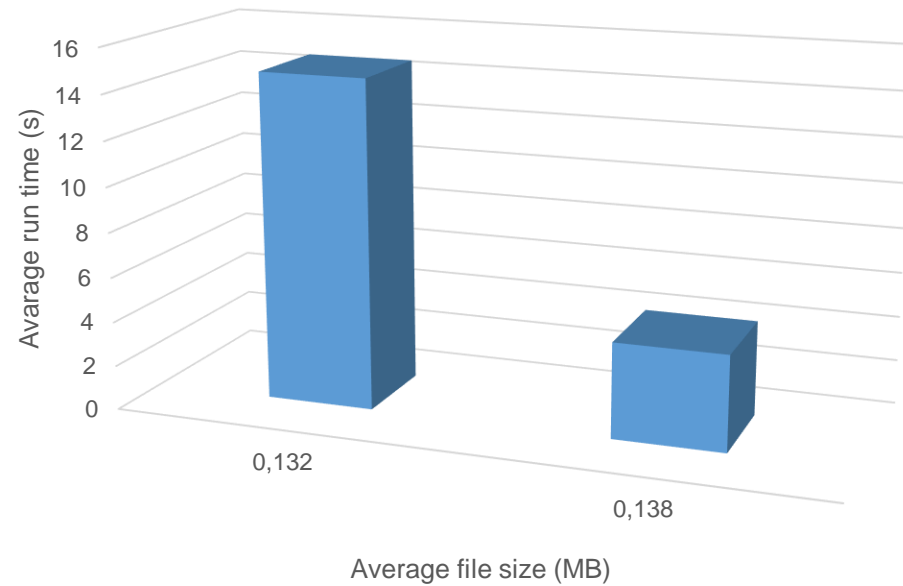


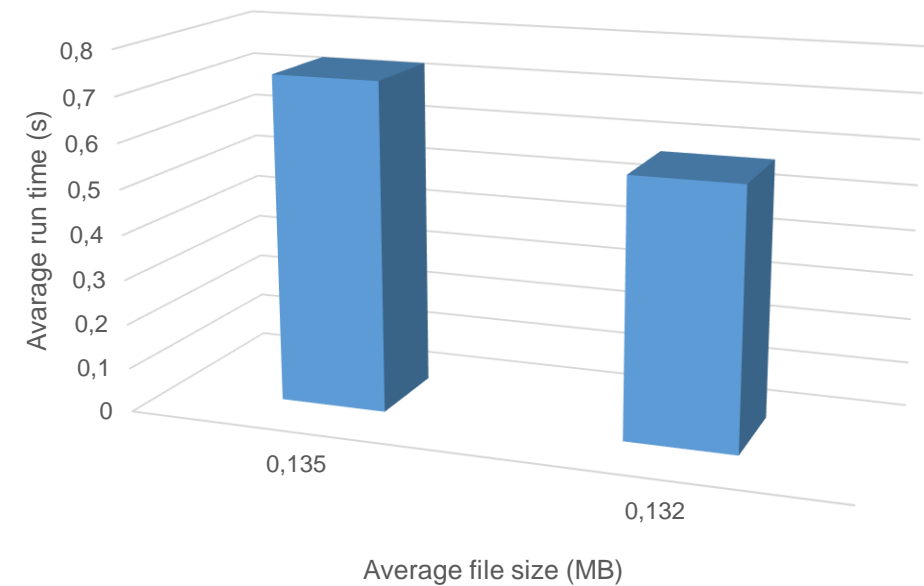
Photo by [Luke Stackpoole](#) on [Unsplash](#)

SVD



 Time Consumption

HUFFMAN



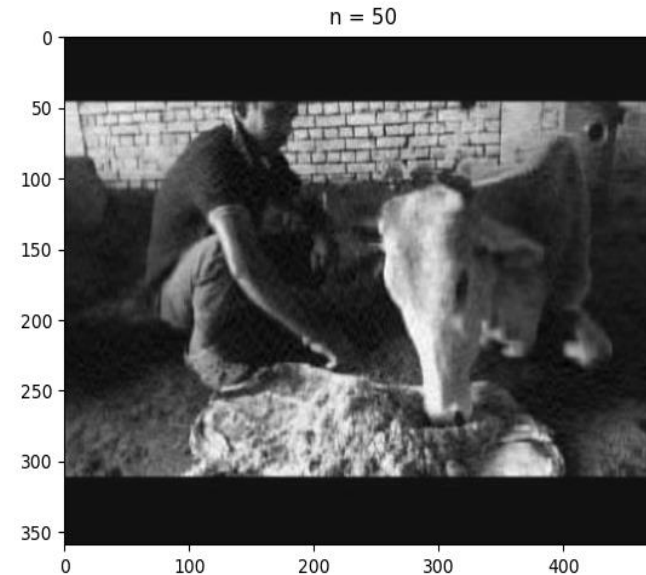
 Time Consumption

Average Compression Ratio



	Compression Ratio
Healthy Cattle	2 : 1
Sick Cattle	2 : 1

Here we represent the rounded Average Compression Ratio of all the images of Healthy Cattle and Sick Cattle that were took into account in the project.





Thanks!

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