PRECISION LIVESTOCK FARMING: OPTIMIZATION OF BATTERY CONSUMPTION BASED ON COMPRESSION ALGORITHMS.

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Team Presentation

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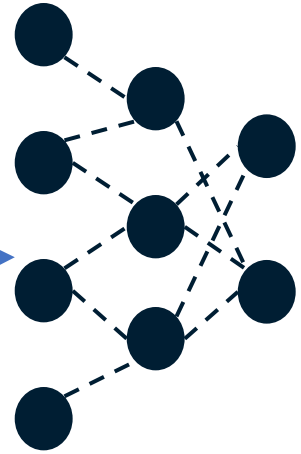
Training Process

Sick-Cattle Images

Healthy-Cattle Images

Convolutional Neural Network

Classification Algorithm



Classification Model

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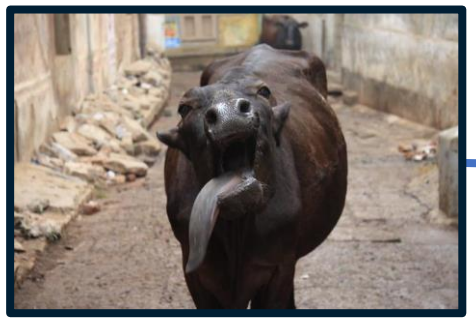
Testing Process



Cattle Image

Compressed image

Seam Carving/ Huffman Coding

Classification Model

Is sick

Output

Compression Algorithm Design

The objective of this seam carving algorithm is to perform content aware resizing of images. This allows image to be resized without losing meaningful content from cropping or scaling. The idea is to locate the image's optimal seams, connected pixel paths going from top to bottom or left

Illustration 1.

to right, to remove or insert while preserving the photorealism of the image. Furthermore, manipulating the gradient energy map that describes how optimal a seam is allows for functionality such as object removal. In the illustration 1 we can see the energy map of the image pixels.

Compression Algorithm Design

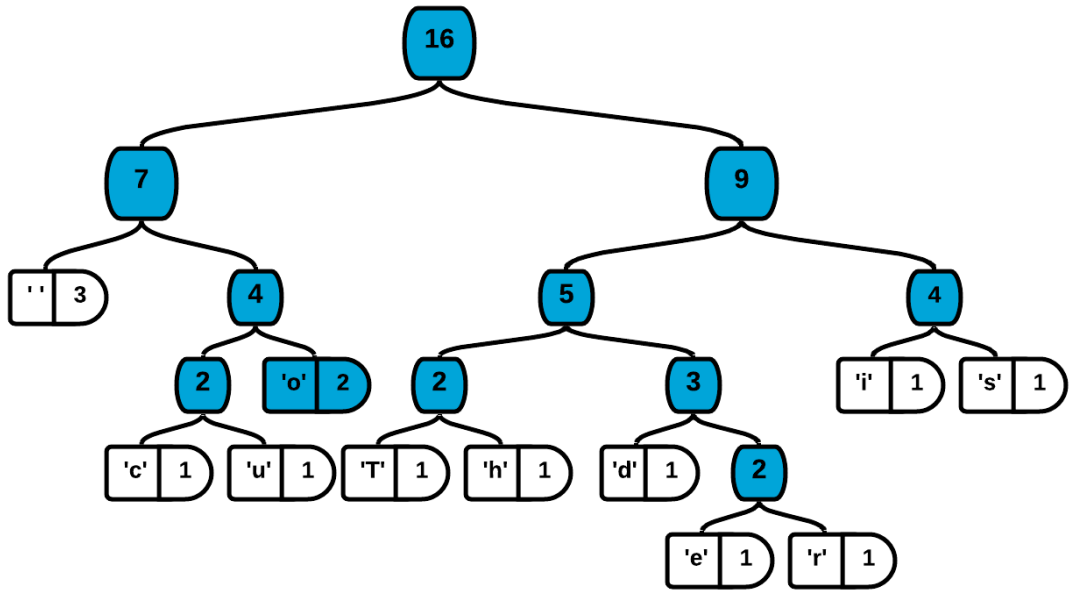


Illustration 2.

We are using the Huffman Coding as a lossless image compression algorithm for animal-health automatic classification. In the illustration 2 we got an example in which we can see a simulation of the sentence “This is our code” being compressed by the Huffman Coding).

Huffman tree or Huffman coding tree defines as a full binary tree in which each leaf of the tree corresponds to a letter in the given alphabet, creating a "dictionary" in which we store the frequencies of each data and create a priority queue with a minheap

Compression Algorithm Complexity

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Create the table in Powerpoint. Do not copy pixelated screenshots from the technical report please!

	Time Complexity	Memory Complexity
Image compression	$O(N^2*M*2^M)$	$O(N*M*2^M)$
Image decompression	O(N*M)	O(1)

Time and memory complexity of the (In this semester, one could be LZS, LZ77, LZ78, Huffman… please choose) algorithm. Please explain what do N and M mean in this problem. PLEASE DO IT!

Explain the tables in your own words

Use superindices to represent the exponents. DO NOT use the ^ symbol

Include a HD picture related to the problem of animal health in precision livestock farming

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Time and Memory Consumption

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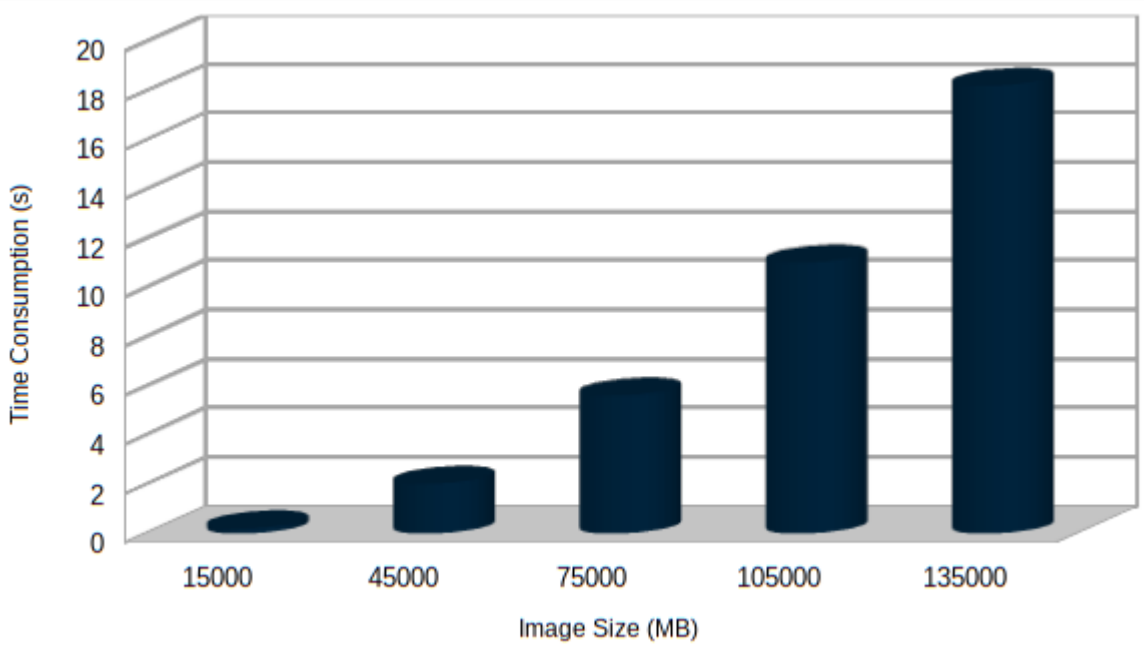
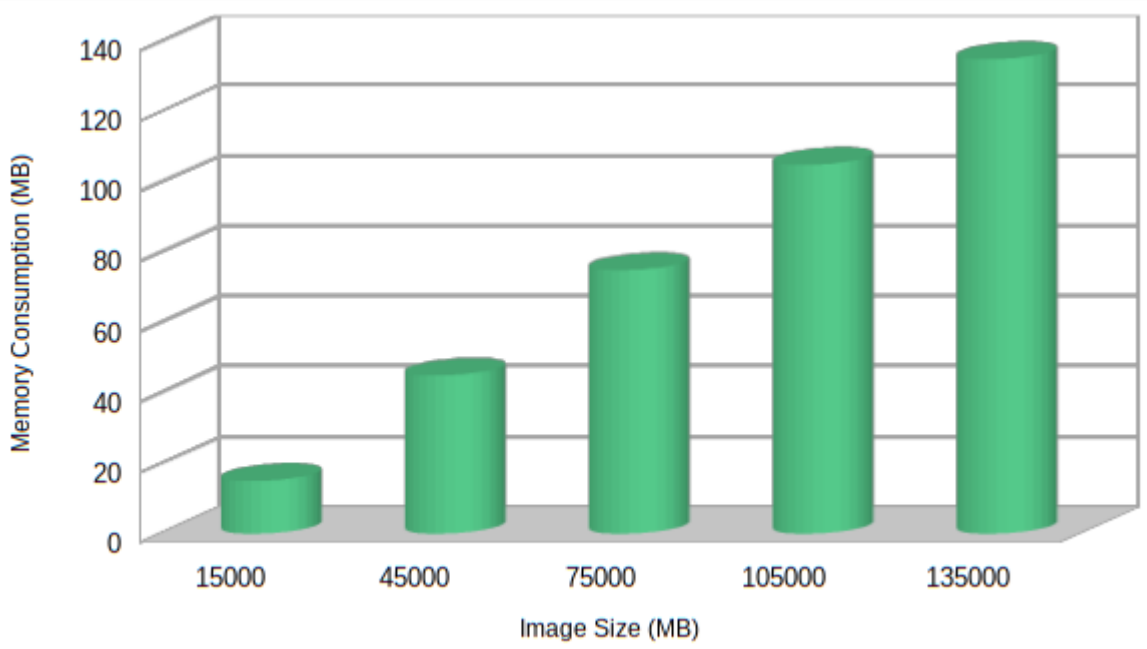
Create the plots in Excel. Do not copy pixelated screenshots from the technical report please!



Time Consumption



Memory Consumption

Please, include measurement units in both X axis and Y axis, for instance, MB, s, KB, minutes...

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Average Compression Ratio

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	Compression Ratio
Healthy Cattle	100 : 1
Sick Cattle	98 : 1

Average compression ratio for Healthy Cattle and Sick Cattle.

Explain the tables in your own words

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Classification Evaluation Metrics

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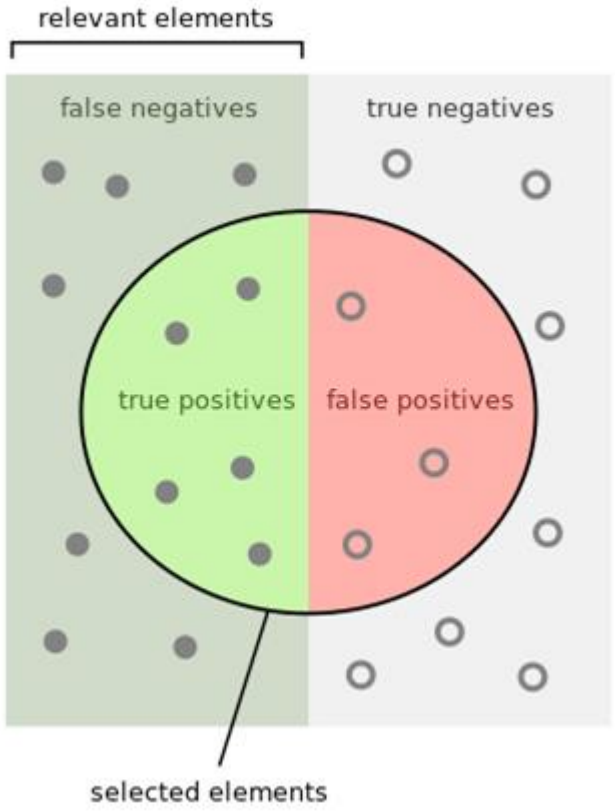
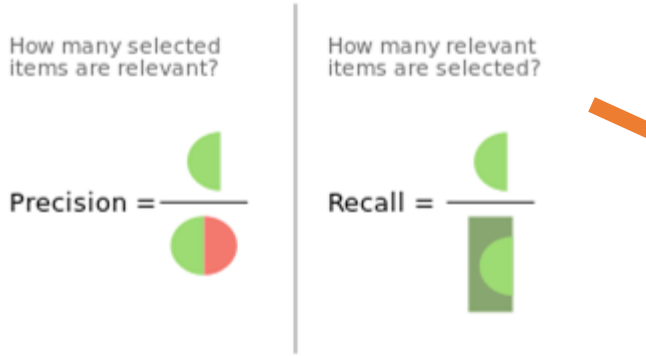
Use vectorized figures to explain the algorithm the evaluation metrics, so they are not pixelated like mines

Use these Colors for Your figures





Explain Accuracy too…

Create a graphical representation using the notation proposed in this slide

If possible, avoid equations for simple concepts that can be explained through diagrams

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Classification Evaluation Metrics

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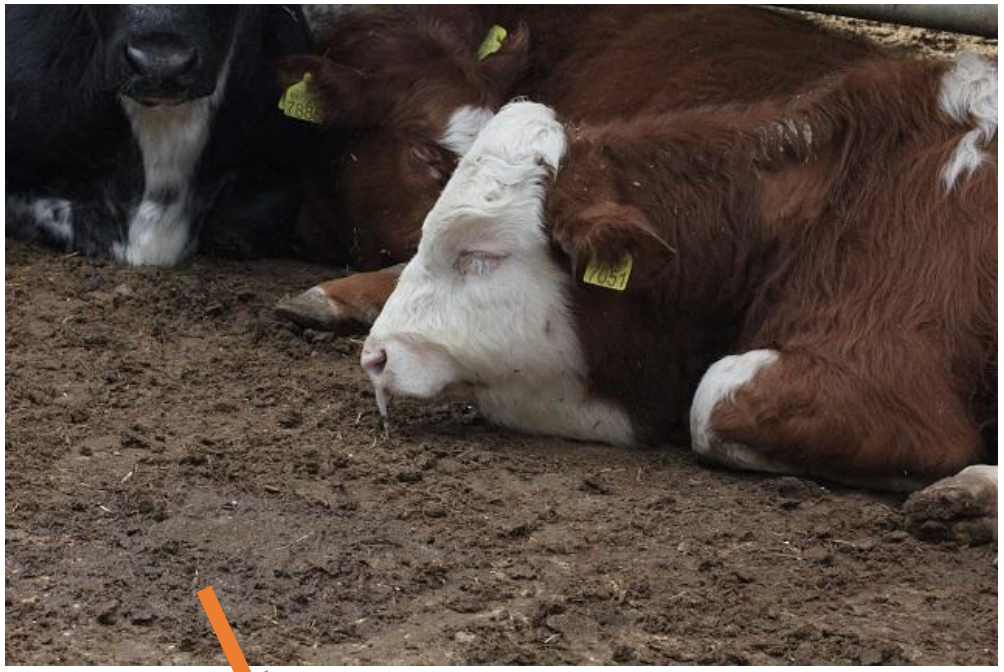
	Testing data set (original images)	Testing data set (compressed images)
Accuracy	0.3	0.2
Precision	0.25	0.21
Recall	0.12	0.11

Evaluation metrics using a testing dataset of ?? healthy cattle and ?? sick cattle images. Compressed images were obtained with ??? algorithm (Please, complete with your algorithm)



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Explain the tables in your own words

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Report Accepted on arXiv

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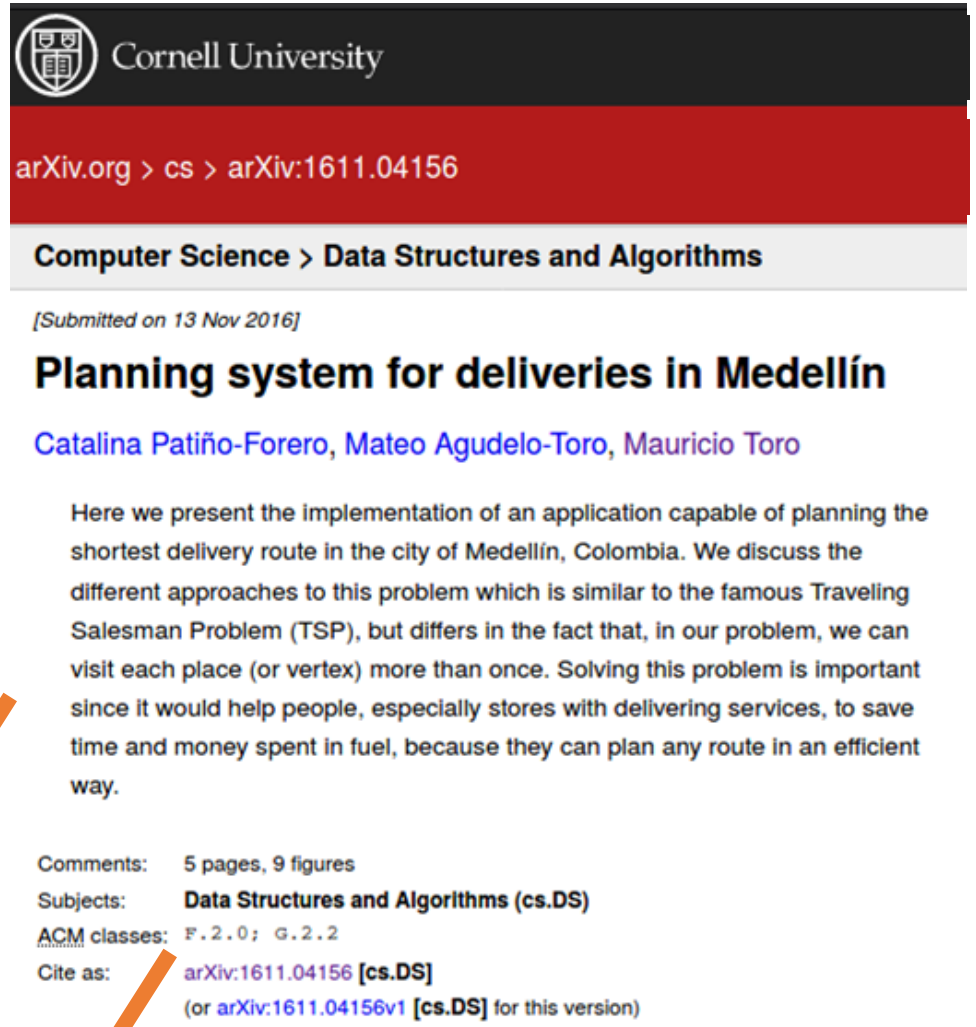
Include the citation of the report in arXiv and link. Alternatively, use OSF

C. Patiño-Forero, M. Agudelo-Toro, and M. Toro. Planning system for deliveries in Medellín. ArXiv e-prints, Nov. 2016. Available at: https://arxiv.org/abs/1611.04156

Include a screenshot



Include the teaching assistant and professor, please

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Please do not forget the acknowledgements to your scholarship (if you have one)

THANK YOU!

Supported by

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