

Making Precision Livestock Farming More Energy Efficient Using Compression Algorithms

Team



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<https://github.com/McEwenAle/ST0245-001>



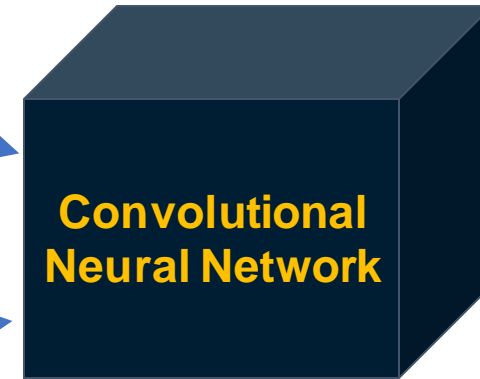
Training Process



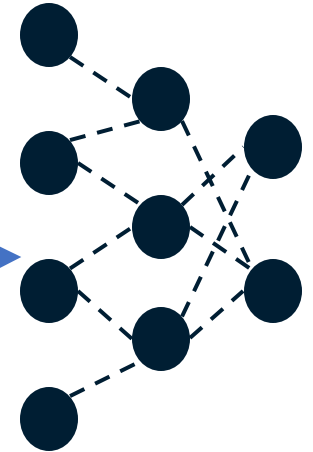
Sick-Cattle Images



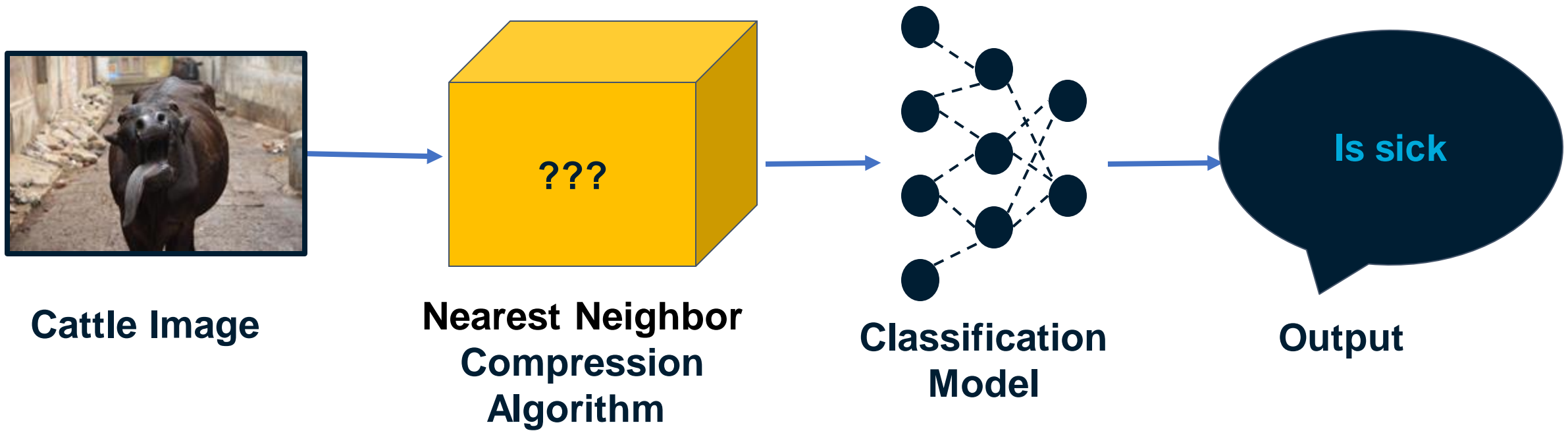
Healthy-Cattle Images

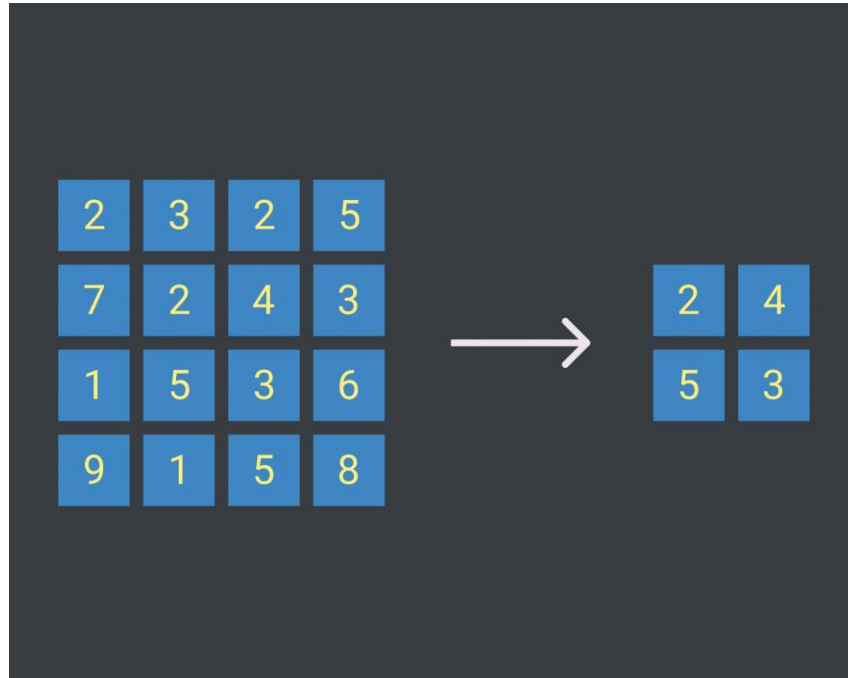


**Classification
Algorithm**

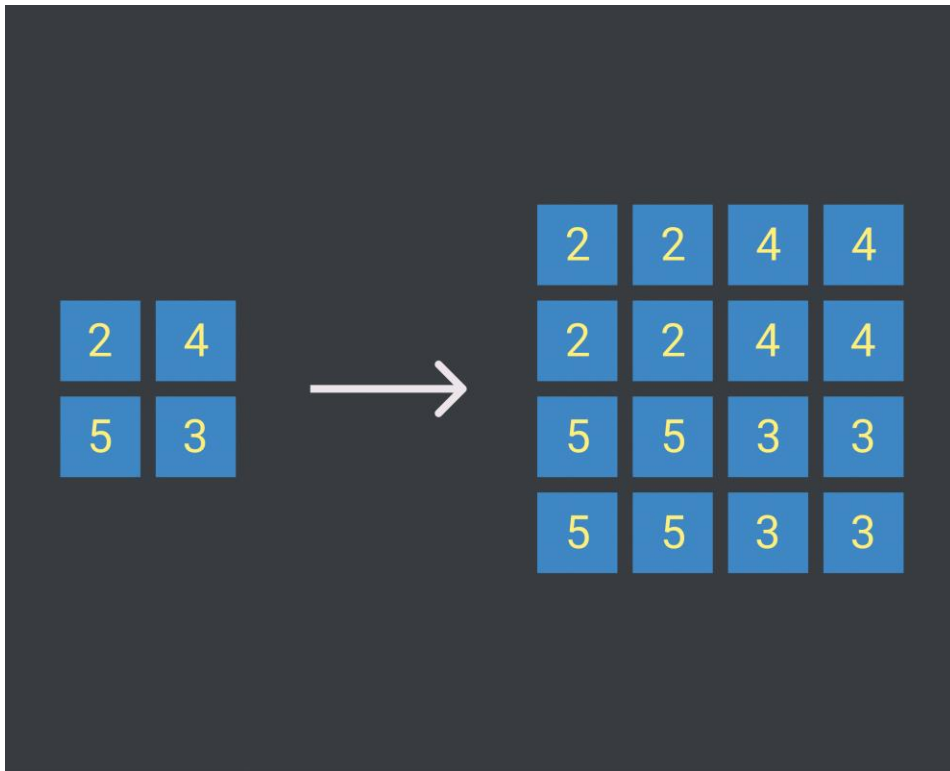


**Classification
Model**





Nearest Neighbor compression gets the most representative pixels of an image and puts them into a compressed image.



Nearest Neighbor decompression takes the pixels and copies them into the higher resolution image.

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

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

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

Time and Memory Consumption

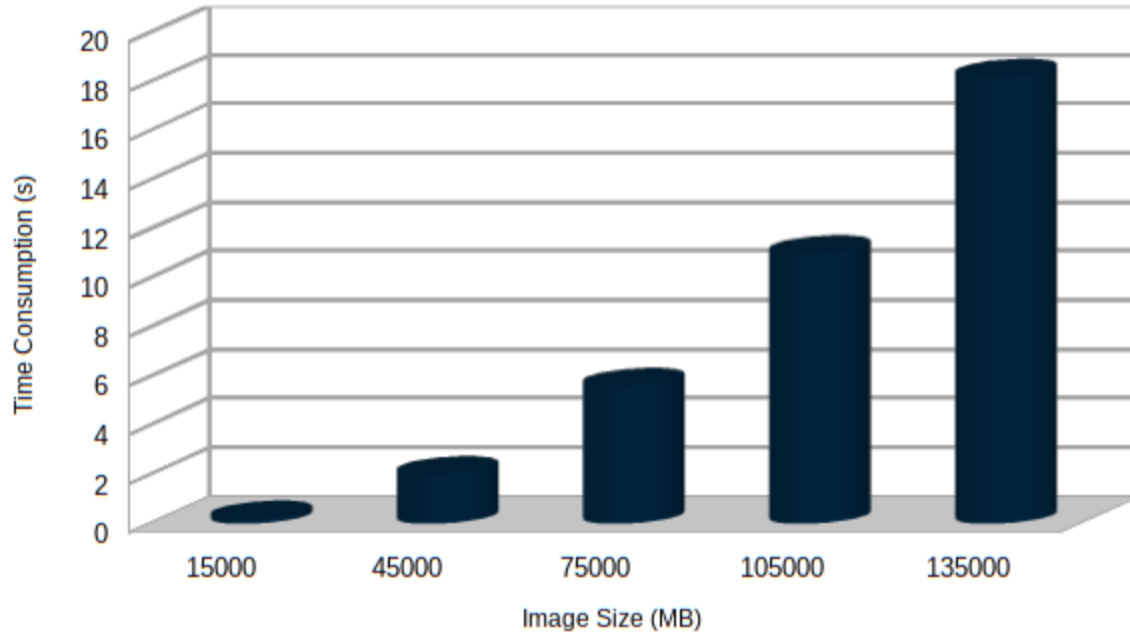
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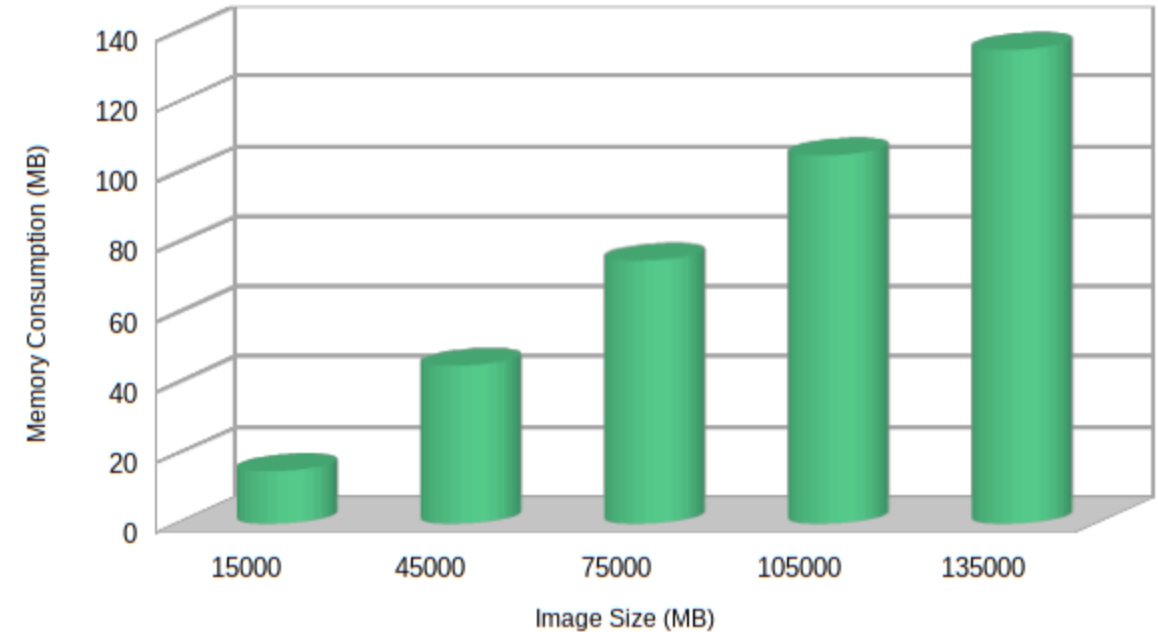


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Create the plots in Excel. Do not copy
pixelated screenshots from the technical
report please!



Time Consumption



Memory Consumption

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

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



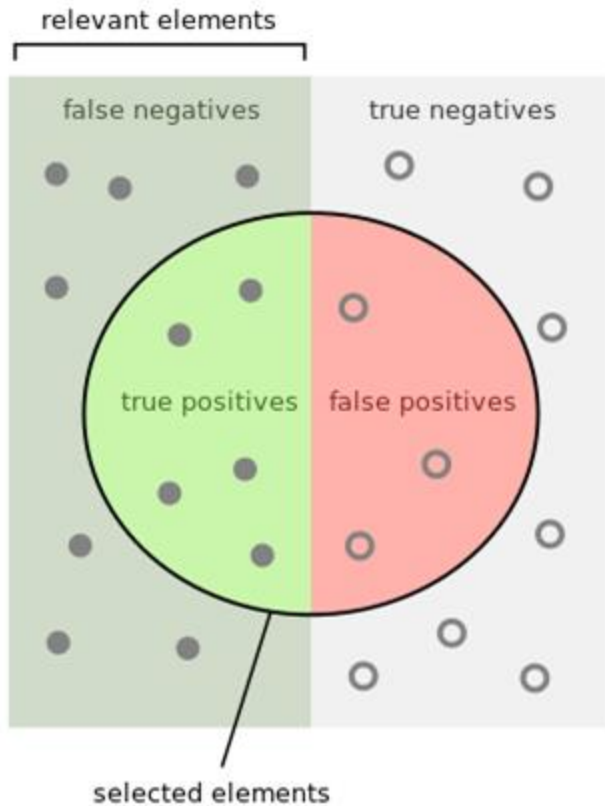
Include a HD picture related to the
problem of animal health in
precision livestock farming

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

How many selected
items are relevant?

$$\text{Precision} = \frac{\text{true positives}}{\text{true positives} + \text{false positives}}$$

How many relevant
items are selected?

$$\text{Recall} = \frac{\text{true positives}}{\text{true positives} + \text{false negatives}}$$

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

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)



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

Explain the tables in your
own words

Report Accepted on arXiv

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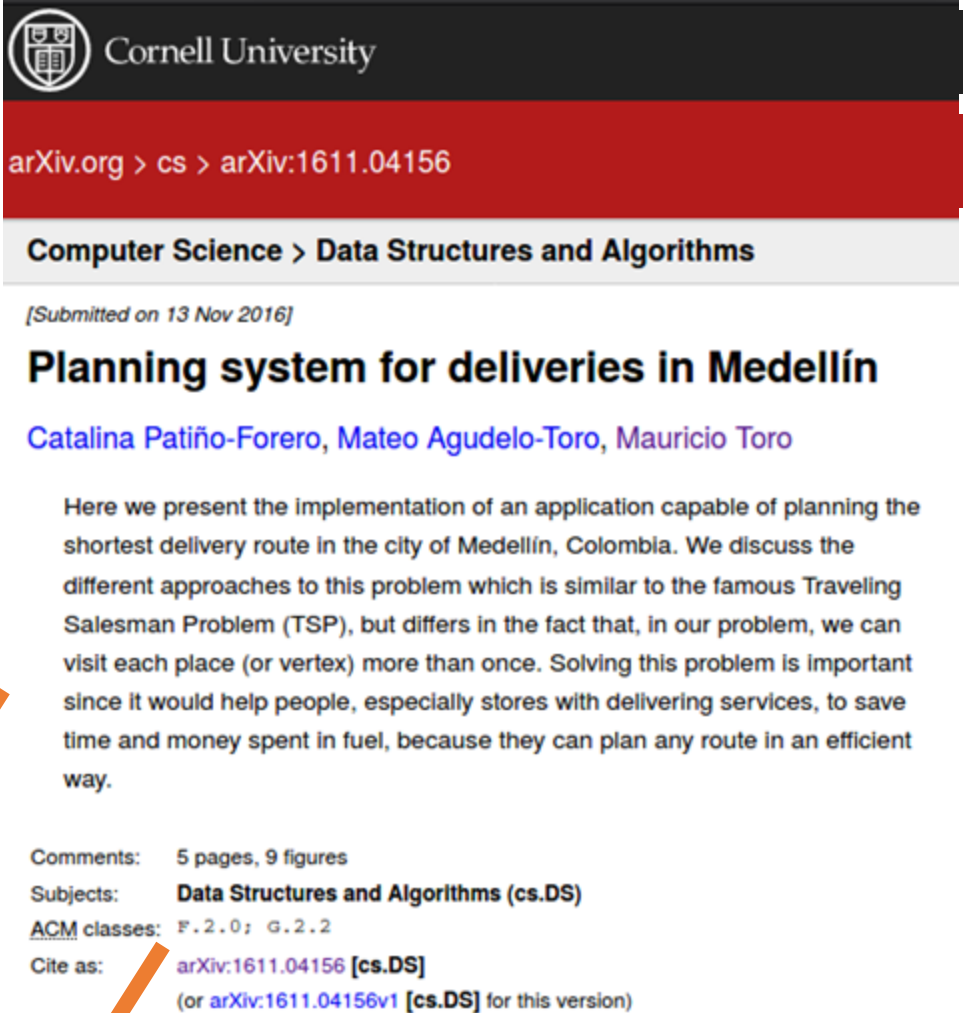
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Include the citation of the report
in arXiv and link. Alternatively, use OSF

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



The screenshot shows the arXiv page for the paper 'Planning system for deliveries in Medellín' by Catalina Patiño-Forero, Mateo Agudelo-Toro, and Mauricio Toro. The page is from Cornell University and is categorized under Computer Science > Data Structures and Algorithms. The submission date is 13 Nov 2016. The abstract describes the implementation of an application for planning the shortest delivery route in Medellín, Colombia, comparing it to the Traveling Salesman Problem (TSP). The page also includes metadata such as 5 pages, 9 figures, and the subjects Data Structures and Algorithms (cs.DS). The citation information is provided at the bottom: arXiv:1611.04156 [cs.DS] (or arXiv:1611.04156v1 [cs.DS] for this version).

Cornell University

arXiv.org > cs > arXiv:1611.04156

Computer Science > Data Structures and Algorithms

[Submitted on 13 Nov 2016]

Planning system for deliveries in Medellín

Catalina Patiño-Forero, Mateo Agudelo-Toro, Mauricio Toro

Here we present the implementation of an application capable of planning the shortest delivery route in the city of Medellín, Colombia. We discuss the different approaches to this problem which is similar to the famous Traveling Salesman Problem (TSP), but differs in the fact that, in our problem, we can visit each place (or vertex) more than once. Solving this problem is important since it would help people, especially stores with delivering services, to save time and money spent in fuel, because they can plan any route in an efficient way.

Comments: 5 pages, 9 figures

Subjects: **Data Structures and Algorithms (cs.DS)**

ACM classes: F.2.0; G.2.2

Cite as: **arXiv:1611.04156 [cs.DS]**
(or arXiv:1611.04156v1 [cs.DS] for this version)



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



THANK YOU!

Supported by

The first two authors are supported by a Sapiencia grant financed by Medellín municipality. All the authors would like to thank the "Vicerrectoría de Descubrimiento y Creación", of Universidad EAFIT, for their support on this research