DATA STRUCTURES FOR IMAGE ANALYSIS AND COMPRESSION

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Team Presentation

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https://github.com/vlz0/ST0245-002

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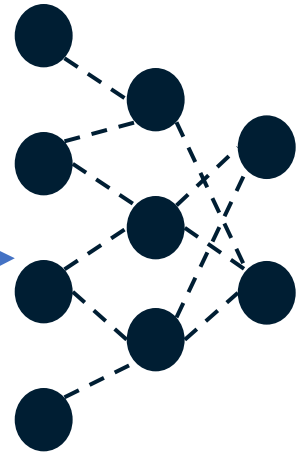
Training Process

Sick-Cattle Images

Healthy-Cattle Images

Convolutional Neural Network

Classification Algorithm



Classification Model

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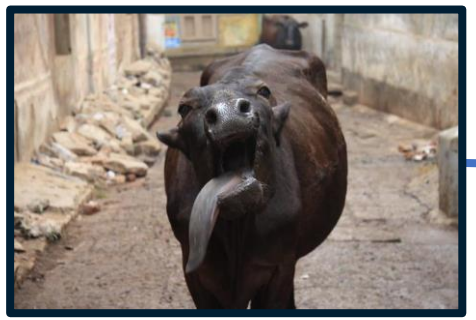
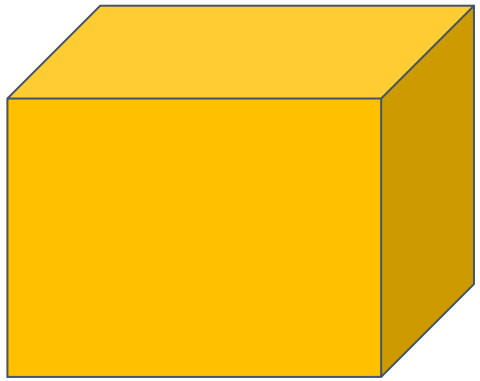
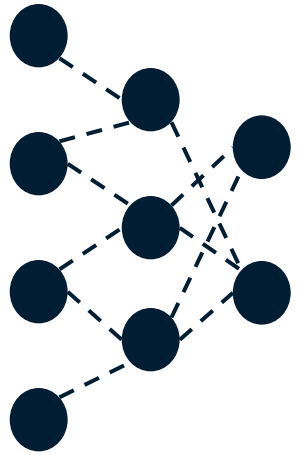
Testing Process



Cattle Image



Integer Scalling & LZ77 Algorithm



Classification Model

Output

Compression Algorithm Design

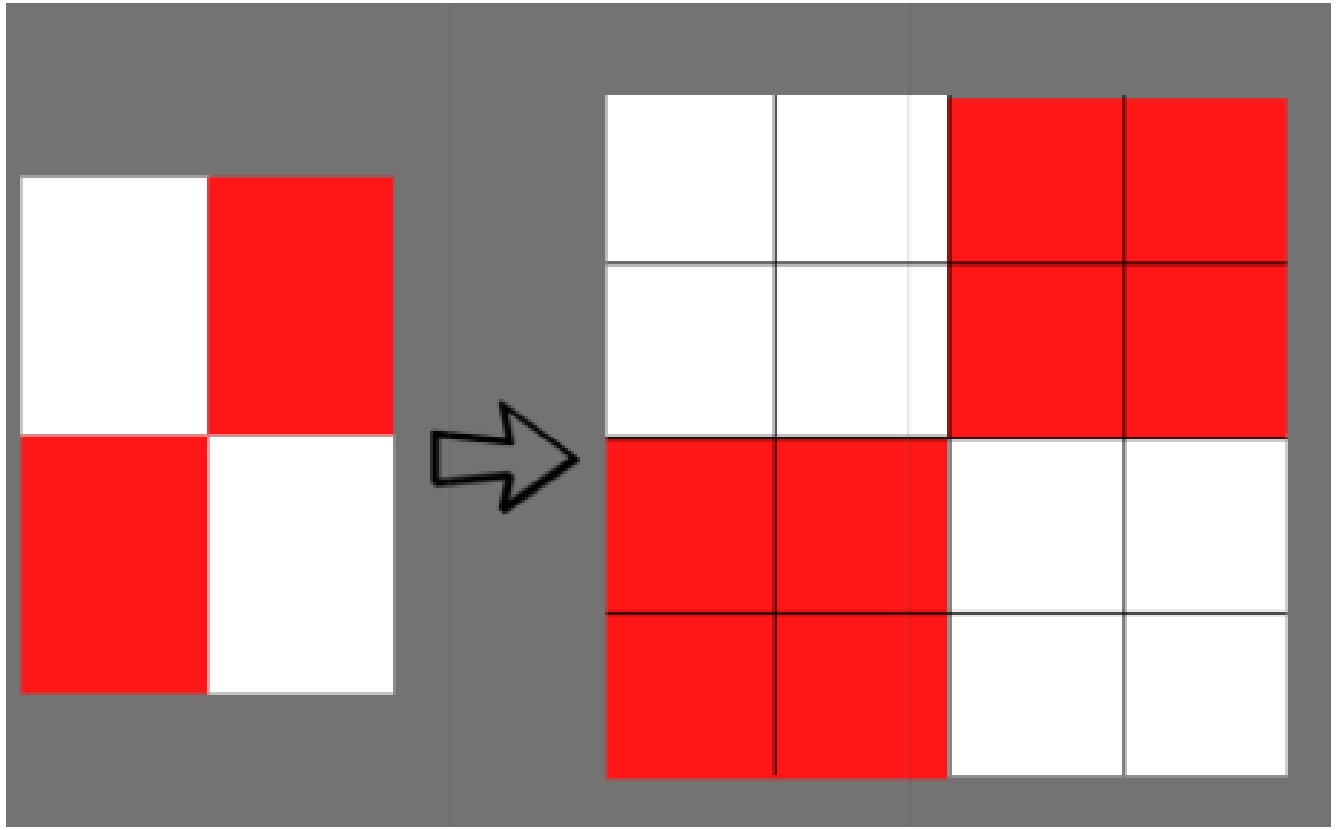


Image compression algorithm for animal-health automatic classification, using Integer Scalling

Compression Algorithm Design

	Uncompressed Output	Dictionary	Buffer	Compressed Input
a)	0			010236
b)	01	2(0,1)	0	10236
c)	010	3(1,0)	1	0236
d)	01001	4(0,0)	0	236
e)	0100110	5(0,1,1)	2	36
f)	0100110101	6(1,0,1)	3	6

When first seeing this graph, we can see just a number table, but in reality we have a visual representation of how the LZ77 lossless compression algorithm works, creating the dictionary, and saving the data up in strings

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Compression Algorithm Complexity

LZ77	Time Complexity	Memory Complexity
Image compression	O (N2*M2)	O (N2*M2)
Image decompression	O (N2*M2)	O (N2*M2)

Integer Scalling	Time Complexity	Memory Complexity
Image compression	O (N*M)	O (N*M)
Image decompression	O (N*M)	O (N*M)

For both algorithms, we have N as the number of rows and M as the number of columns of the matrix containing the image pixels

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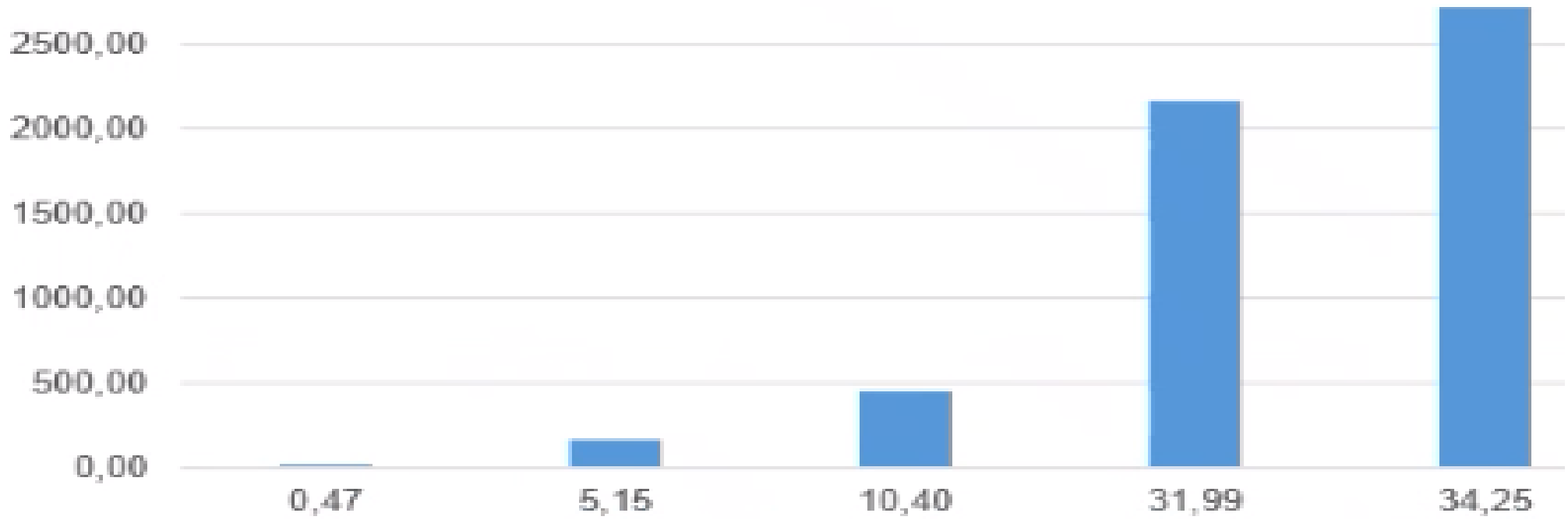
Time and Memory Consumption



Time and Memory Consumption

Average Compression Ratio

	Compression Ratio
Healthy Cattle	3 : 1
Sick Cattle	3 : 1

Average compression ratio for Healthy Cattle and Sick Cattle.

THANKS!

Supported by

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