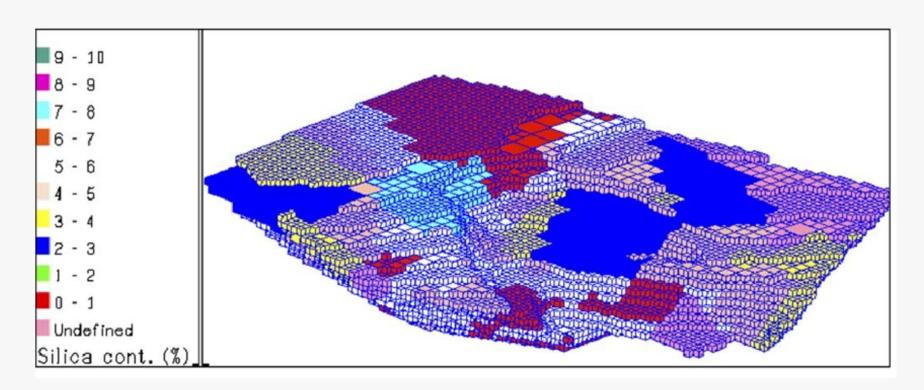
Block Model Compressor

GROUP 14

Industry Overview



The Problem &. The Solution



The challenge of storing and managing the vast amounts of data associated with large geological block models efficiently.

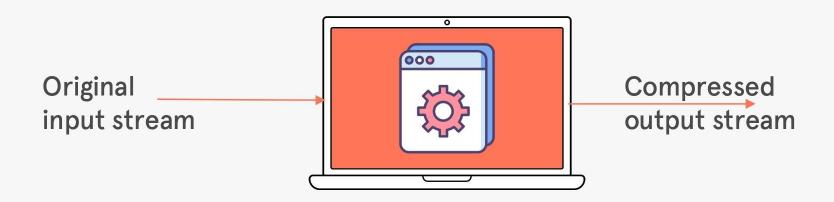


A fast, lossless stream compressor specifically designed for large geological block models.

SOLUTION

A fast, lossless stream compressor

specifically designed for large geological block models.



A User Case:



Geologic researcher /Data analyst

Start Run the Compressor

"I provide an input stream with a commonly used format:

I instantly get the format feeding visualization software friendly:

```
32,16,0,4,4,1,sea <- Coordinates and size
36,16,0,2,1,1,sea of the compressed block,
38,16,0,2,1,1,sea followed original tag
label
36,18,0,1,1,1,SA
36,19,0,2,1,1,SA
37,18,0,2,1,1,sea
Stream continued...
```

The size has been reduced to 2% of the original size, It takes only seconds for the transition! "

DEMOSTRATION

Input:

the_intro_one.csv (64 x 64 x 8)

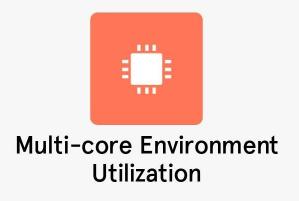
Result:

Compression rate: 93.8%

Speed: 24.7%

```
Dock_test
                 III the intro one 32768 4x4x4.csv X
                 BLOCK14PG > src > build > ## the intro one 32768 4x4x4.csv
                      64,64,8,4,4,4
                       e, NSW
                       n, NT
                       q, QLD
                       s, SA
                       t. TAS
                       v, VIC
                       W, WA
                       o, sea
nake_install.cmake
MakeCache.txt
                       akefile
                       intro one 32768 4...
npressor
                                                                    > zsh - build + v [
                                   DEBUG CONSOLE
lti-threads-handling
ianore
akeLists.txt
n.cpp
idme.md
inore
keLists.txt
DME.md
                       zhouzhaotong@shuuakiras-MacBook-Air build %
```

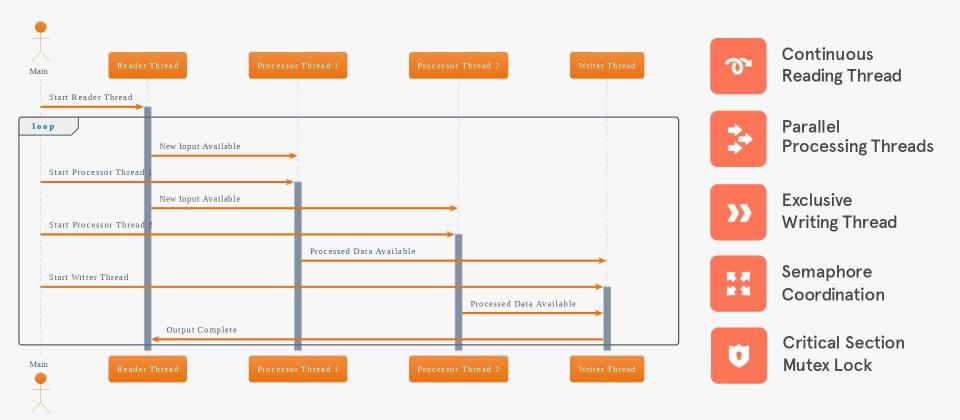
Key User Stories Affecting Software Efficiency



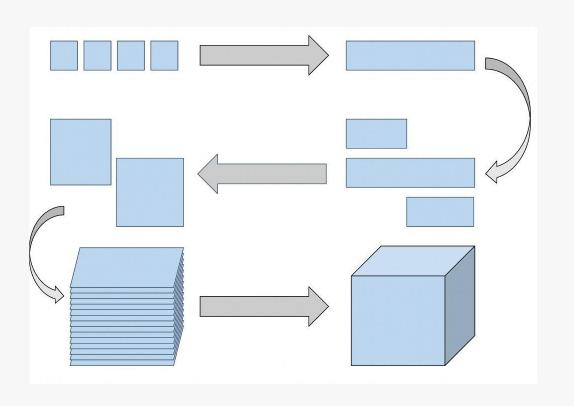




Multi-core Environment



Lossless 3D Compression Algorithm





Line Compression Run-Length Encode



Plane Compression Greedy Algorithm



Cuboid Compression Greedy Algorithm

Lossless 3D Compression Algorithm

```
40,0,0,1,1,1,#FF5555
40,1,0,1,1,1,#AA5500
41,0,0,1,2,1,#AA5500
40,0,1,1,1,#FF5555
40,1,1,1,1,#AA5500
41,0,1,1,2,1,#AA5500
42,0,0,2,2,1,#AA5500
42,0,1,2,2,1,#AA5500
44,0,0,2,2,1,#AA5500
44,0,1,2,2,1,#AA5500
46.0.0.1.1.1.#AA5500
```



Output Handler transforms the Cuboid to designate output



Each cuboid is defined by the top left point's coordinates, width, height, depth, and color tag



Compression ratio is determined by the number of cuboids outputted

Future Steps

