SPARSE MAT-MUL ON THE GPU

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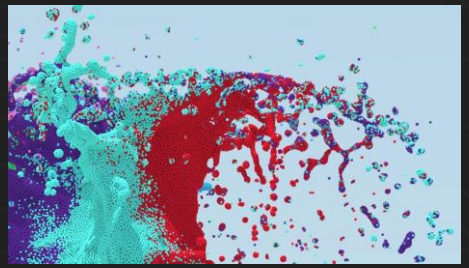
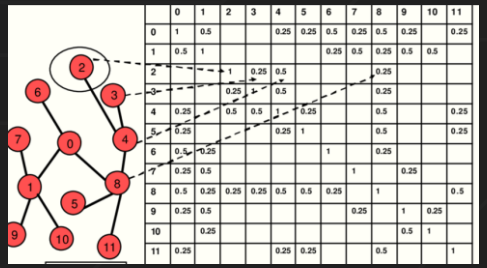
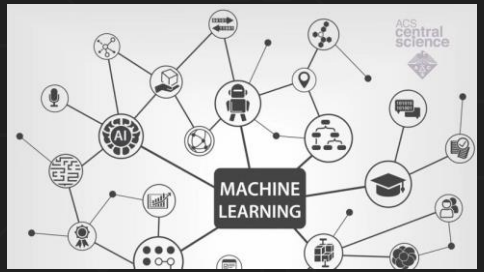
BACKGROUND



Scientific Computing



Graph Algorithms



Machine Learning

OUR IMPLEMENTATIONS

Sparse Matrix Representation

1	0	0
0	2	0
0	3	0

Row pointers

0	1	2	3

Column indices

0	1	1

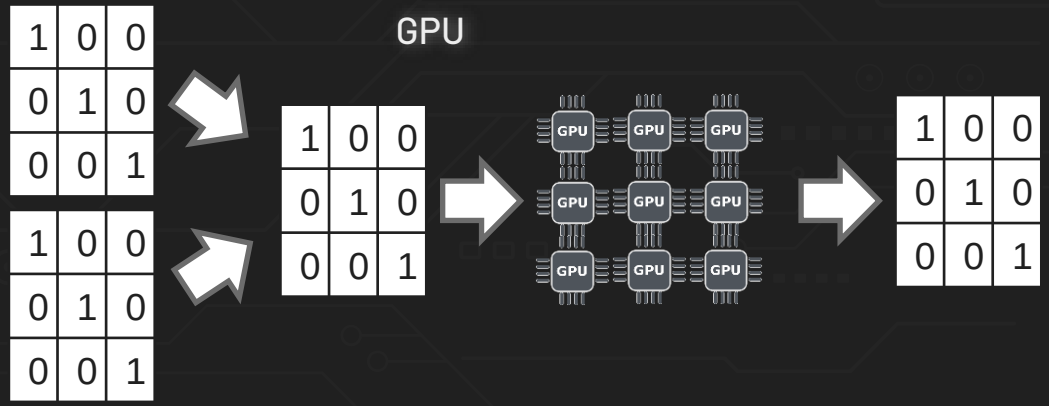
Values

1	2	3

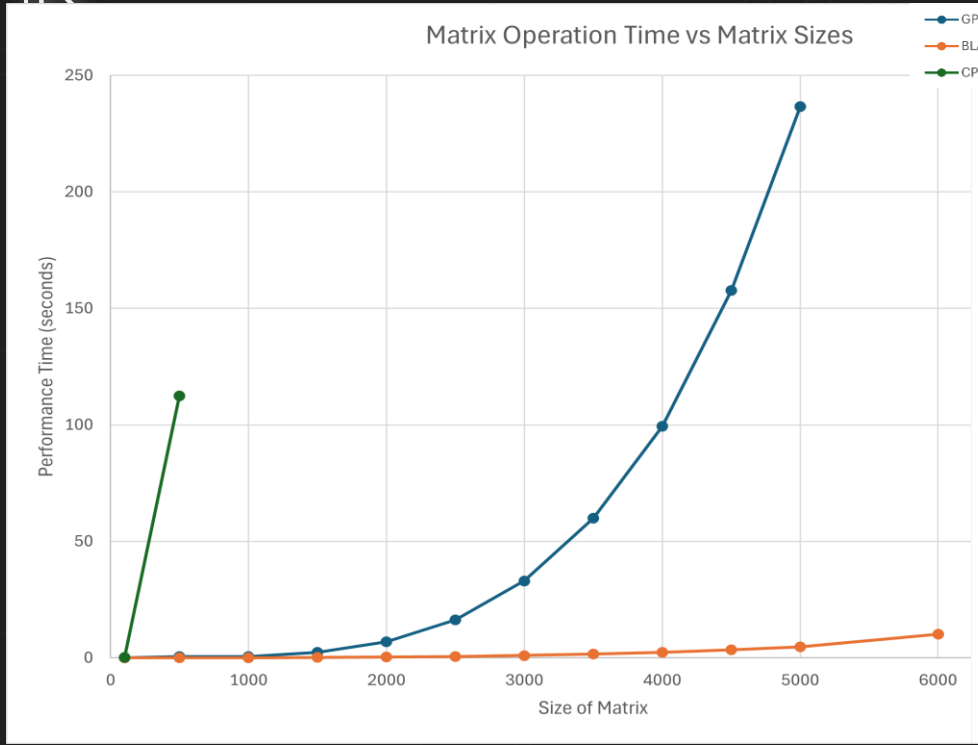
Serial

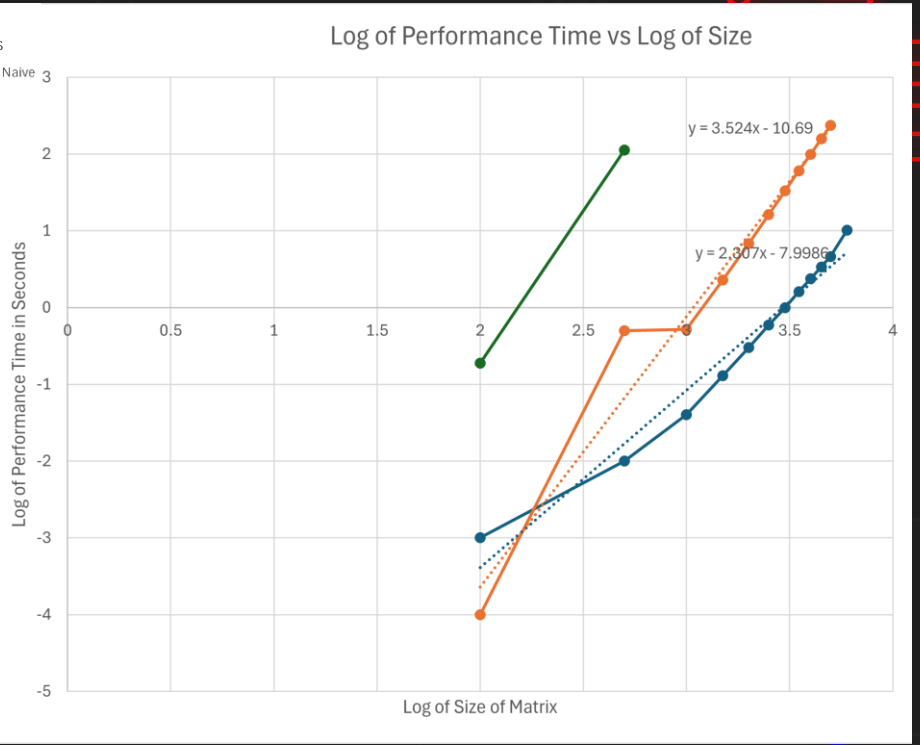
$$\begin{bmatrix} a_1 & a_2 & a_3 \\ a_4 & a_5 & a_6 \\ a_7 & a_8 & a_9 \end{bmatrix} \begin{bmatrix} b_1 & b_2 & b_3 \\ b_4 & b_5 & b_6 \\ b_7 & b_8 & b_9 \end{bmatrix} = \begin{bmatrix} c_1 & c_2 & c_3 \\ c_4 & c_5 & c_6 \\ c_7 & c_8 & c_9 \end{bmatrix}$$

GPU



PERFORMANCE RESULT





OPTIMIZATIONS