Ciclo minimo y Ciclo de Hamilton
Matemática Computacional

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2 Análisis teorico

Dada la multiplicación de dos matrices A y B

$$AB = \begin{pmatrix} A_{11} & A_{12} \\ A_{21} & A_{22} \end{pmatrix} \begin{pmatrix} B_{11} & B_{12} \\ B_{21} & B_{22} \end{pmatrix} = \begin{pmatrix} A_{11}B_{11} + A_{12}B_{21} & A_{11}B_{12} + A_{12}B_{22} \\ A_{21}B_{11} + A_{22}B_{21} & A_{21}B_{12} + A_{22}B_{22} \end{pmatrix} = \begin{pmatrix} C_{11} & C_{12} \\ C_{21} & C_{22} \end{pmatrix}$$

Se calculan los S y los T de la técnica de Strassen.

$$
\begin{aligned}
S_1 &= A_{21} + A_{22} \\
S_2 &= A_{21} + A_{22} - A_{11} \\
S_3 &= A_{11} - A_{21} \\
S_4 &= A_{12} - A_{21} - A_{22} + A_{11}
\end{aligned}
$$

$$
\begin{aligned}
T_1 &= B_12 - B_{11} \\
T_2 &= B_{22} - B_{12} + B_{11} \\
T_3 &= B_{22} - B_{12} \\
T_4 &= B_{22} - B_{12} + B_{11} - B_{21}
\end{aligned}
$$

Se calculan los P.

$$
\begin{aligned}
P_1 &= A_{11}B_{21} \\
P_2 &= A_{12}B_{21} \\
P_3 &= A_{12}B_{22} - A_{21}B_{22} - A_{22}B_{22} + A_{11}B_{22} \\
P_4 &= A_{22}B_{22} - A_{22}B_{12} + A_{22}B_{11} - A_{22}B_{21} \\
P_5 &= A_{21}B_{11} - A_{21}B_{11} + A_{22}B_{12} - A_{22}B_{11} \\
P_6 &= A_{21}B_{22} - A_{21}B_{12} + A_{21}B_{11} + A_{22}B_{22} - A_{22}B_{12} + A_{22}B_{11} - A_{11}B_{22} + A_{11}B_{22} \\
&\quad + A_{11}B_{12} - A_{11}B_{11} \\
P_7 &= A_{11}B_{22} - A_{11}B_{12} - A_{21}B_{22} + A_{21}B_{12}
\end{aligned}
$$

Se calculan los U

$$
\begin{aligned}
U_1 &= A_{11}B_{11} + A_{12}B_{21} \\
U_2 &= A_{21}B_{22} - A_{21}B_{12} + A_{21}B_{11} + A_{22}B_{22} - A_{22}B_{12} + A_{22}B_{11} - A_{11}B_{22} + A_{11}B_{12} \\
U_3 &= A_{21}B_{11} + A_{22}B_{22} - A_{22}B_{12} + A_{22}B_{11} \\
U_4 &= A_{21}B_{22} + A_{22}B_{22} - A_{11}B_{22} + A_{11}B_{12} \\
U_5 &= A_{11}B_{12} + A_{12}B_{22} \\
U_6 &= A_{21}B_{11} + A_{22}B_{21} \\
U_7 &= A_{22}B_{22} + A_{21}B_{12}
\end{aligned}
$$

De está forma se obtiene que

$$\begin{pmatrix} U_1 & U_5 \\ U_6 & U_7 \end{pmatrix} = \begin{pmatrix} A_{11}B_{11} + A_{12}B_{21} & A_{11}B_{12} + A_{12}B_{22} \\ A_{21}B_{11} + A_{22}B_{21} & A_{21}B_{12} + A_{22}B_{22} \end{pmatrix} = \begin{pmatrix} C_{11} & C_{12} \\ C_{21} & C_{22} \end{pmatrix}$$

Con lo que se demuestra que el algoritmo de strassen es equivalente a la multiplicación de matrices.

3 Explicación algoritmo

4 Formulación experimentos

5 Información de Hardware y Software

5.1 Notebook - Danilo Abellá

5.1.1 Software

- SO: Xubuntu 16.04.1 LTS

- GMP Library

- Mousepad 0.4.0

5.1.2 Hardware

- AMD Turion(tm) X2 Dual-Core Mobile RM-72 2.10GHz

- Memoria (RAM): 4,00 GB(3,75 GB utilizable)

- Adaptador de pantalla: ATI Raedon HD 3200 Graphics

5.2 Notebook - Sergio Salinas

5.2.1 Software

- SO: ubuntu Gnome 16.04 LTS

- Compilador: gcc version 5.4.0 20160609

- Editor de text: Atom

5.2.2 Hardware

- Procesador: Intel Core i7-6500U CPU 2.50GHz x 4

- Video: Intel HD Graphics 520 (Skylake GT2)

6 Curvas de desempeño de resultados

7 Conclusiones