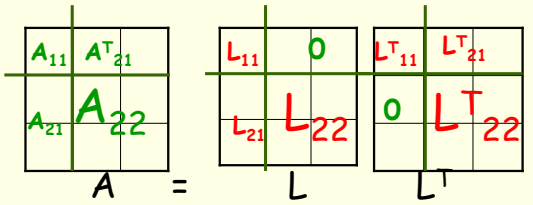
CPU multicore

Fattorizzazione di cholesky a blocchi



$A_{11} = L_{11} L^T_{11}$ $A^T_{21} = L_{11} L^T_{21}$

$A_{21} = L_{21} L^T_{11}$ $A_{22} = L_{21} L^T_{21} + L_{22} L^T_{22}$

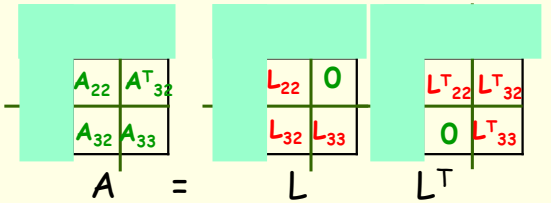
Fattorizzazione di cholesky a blocchi

$A_{11} = L_{11} L^T_{11} \rightarrow L_{11} = Chol(A_{11})$

$A^T_{21} = L_{11} L^T_{21}$
$A_{21} = L_{21} L^T_{11} \rightarrow L_{21} = A_{21} L^{-T}_{11}$

$A_{22} = L_{21} L^T_{21} + L_{22} L^T_{22} \rightarrow L_{22} L^T_{22} = A_{22} - L_{21} L^T_{21}$

Fattorizzazione di cholesky a blocchi



$A_{22} = L_{22} L^T_{22}$ $A^T_{32} = L_{22} L^T_{32}$

$A_{32} = L_{32} L^T_{22}$ $A_{33} = L_{32} L^T_{32} + L_{33} L^T_{33}$

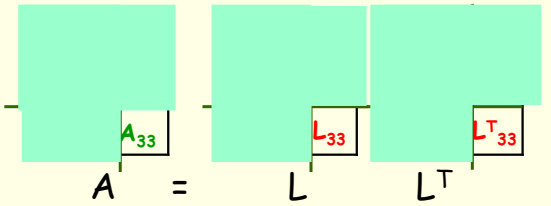
Fattorizzazione di cholesky a blocchi

$A_{22} = L_{22} L^T_{22} \rightarrow L_{22} = Chol(A_{22})$

$A^T_{32} = L_{22} L^T_{32}$
$A_{32} = L_{32} L^T_{22} \rightarrow L_{32} = A_{32} L^{-T}_{22}$

$A_{33} = L_{32} L^T_{32} + L_{33} L^T_{33} \rightarrow L_{33} L^T_{33} = A_{33} - L_{32} L^T_{32}$

Fattorizzazione di cholesky a blocchi



$A_{33} = L_{33} L^T_{33} \rightarrow L_{33} = Chol(A_{33})$

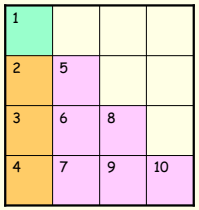
Fattorizzazione LL^T a blocchi

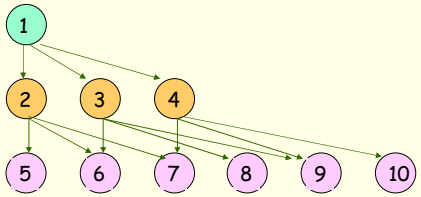
```
for K = 1, NB

  L(K,K) =  Chol( A(K,K) )

  for I = K+1, NB
     L(I,K) = A(I,K)L(K,K)^-T
  endfor

  for I = K+1, NB
    for J = K+1, …
      A(I,J) = A(I,J)- L(I,K) L(J,K)^T
    endfor
  endfor

endfor
```


Uso di BLAS/LAPACK

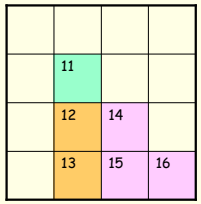
```
for K = 1, NB

  L(K,K) =  Chol( A(K,K) )  ──────────►  DPOTF2

  for I = K+1, NB
     L(I,K) = A(I,K)L(K,K)^-T  ──────►  DTRSM
  endfor

  for I = K+1, NB
    for J = K+1, …
      A(I,J) = A(I,J)- L(I,K) L(J,K)^T  ──►  DGEMM
    endfor
  endfor

endfor
```

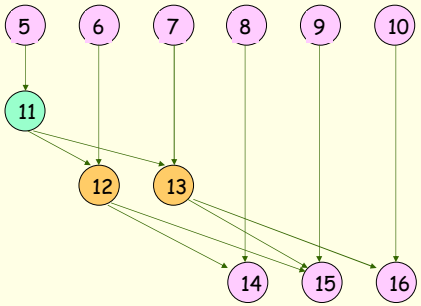
Esempio NB=4



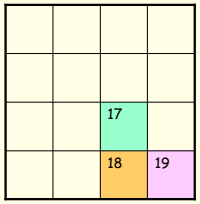


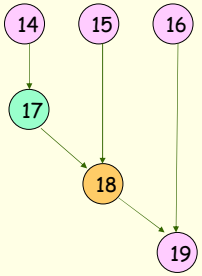
Esempio NB=4





Esempio NB=4





Esempio NB=4