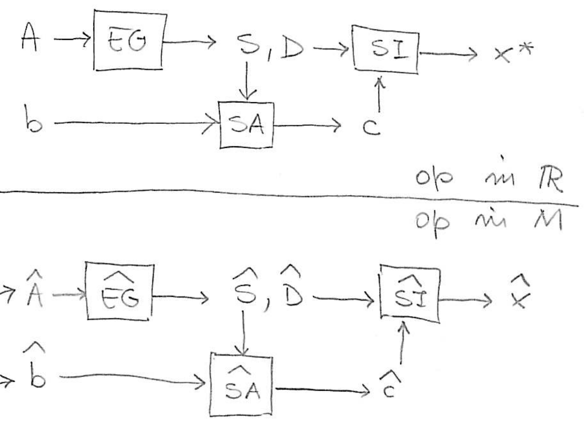
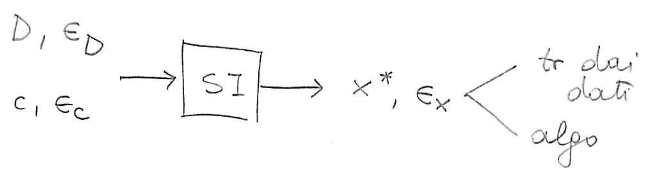
STUDIO IN $F(\beta,m)$

Oss:



ad es rd(A), rd(b)



$\epsilon_d \le \mu(D)\,\epsilon_c \quad (\epsilon_D = 0)$

$\hat{\epsilon}_d \le \mu(D)\,\epsilon_D \quad (\epsilon_c = 0)$

SE $\mu(D)$ grande ϵ_d può essere $\gg$ err sui dati

Es: $\gamma \in (0,1)$, $A(\gamma) = \begin{bmatrix} \gamma & 1 \\ 1 & 0 \end{bmatrix}$; $A^{-1}(\gamma) = \begin{bmatrix} 0 & 1 \\ 1 & -\gamma \end{bmatrix}$

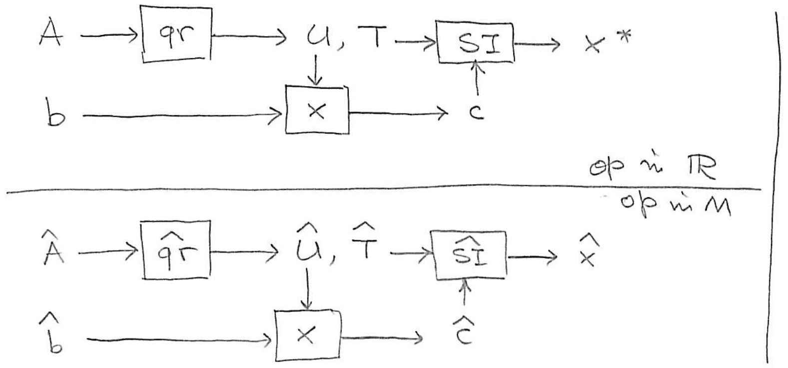
$\|A(\gamma)\|_\infty = 1+\gamma$, $\|A^{-1}(\gamma)\|_\infty = 1+\gamma \Rightarrow \mu_\infty(A) = (1+\gamma)^2 \in (1,4)$

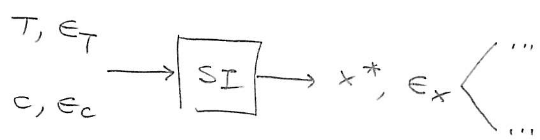
$EG \rightarrow D(\gamma) = \begin{bmatrix} \gamma & 1 \\ 0 & -1/\gamma \end{bmatrix}$, $\mu(D) \ge \frac{1}{\gamma^2}$ non limitato

con EGPP: $D'(\gamma) = I$, $\mu_\infty(D') = 1$

EG con PIVOTING PARZIALE ...

Oss:





$\epsilon_d \le \mu(T)\,\epsilon_c$

$\hat{\epsilon}_d \le \mu(T)\,\epsilon_T$

- quanto grande può essere $\mu(T)$?

In $\mathbb{R}^n$, N_2: $T = U^T A \Rightarrow \|T\|_2 \le \|A\|_2$

$T^{-1} = A^{-1}U \Rightarrow \|T^{-1}\|_2 \le \|A^{-1}\|_2$ q.di $\mu_2(T) \le \mu_2(A)$

ovvero: utilizz QR si ottiene un sist equiv a quello iniziale con condiz non peggiore!

COSTO

def (costo aritmetico): # pseudo-op eseguite per portare a termine...

Oss: 1) confronti a "costo zero"... ragionevole se pochi.

2) costo pseudo-op indip da operandi (falso in C.A.)

Es: ① $\phi_1(a,b) = a_1 \overset{1}{\otimes} b_1 \overset{n+1}{\oplus} \cdots \overset{2n-1}{\oplus} a_n \overset{n}{\otimes} b_n \quad (\approx a^T b)$

costo $\phi_1 = nP + (n-1)S \quad (\sim n)$

② $\phi_2(A,b) = (\phi_1(\hat{a}_1,b), \dots, \phi_1(\hat{a}_n,b))^T \quad (\approx Ab)$

costo $\phi_2 = n^2 P + n(n-1) S \quad (\sim n^2)$

Oss: se A è ad es tr si ha $(\xi \otimes 0 = 0,\ \xi \oplus 0 = \xi)$

costo 1° comp $= 1P + 0S$

" 2° " $= 2P + 1S$

etc... costo $\phi_2^{tr} = \frac{n(n+1)}{2} P + \frac{n(n-1)}{2} S \quad \left(\sim \frac{n^2}{2}\right)$

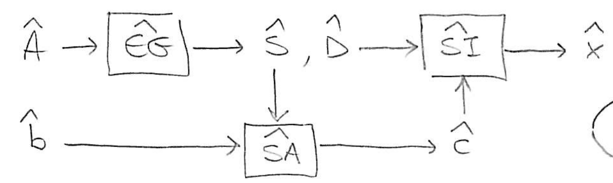
③ $\phi_3(T,c) = \widehat{SI}(T,c) \quad (\approx SI(T,c))$

costo $\phi_3 = nD + \frac{n(n-1)}{2}(P+S) \quad \left(\sim \frac{n^2}{2}\right)$

④ $\phi_4(A) = \widehat{EG}(A) \quad (\approx EG(A))$

costo $\phi_4 = \frac{n^2+n}{2} D + \frac{2n^3 - 3n^2 + n}{6}(P+S) \quad \left(\sim \frac{n^3}{3}\right)$

Oss:



costo $\sim \frac{n^3}{3}$