introduction

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Sci.interests:
regularization
of inverse problems

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regularized fixed-point

$\hat{u}$: $\quad Fu = y$

regularized fixed-point

$\hat{u}$: $Fu = y$ $F = A + G$

regularized fixed-point

$\hat{u}$: $\quad Fu = y \qquad F = A + G$

$$Au = y - Gu$$

regularized fixed-point

$\hat{u}$: $\qquad Fu = y \qquad F = A + G$

$$Au_{k+1} = y - Gu_k$$

regularized fixed-point

$\hat{u}$: $Fu = y$ $F = A + G$

$$Au_{k+1} = y_\delta - Gu_k$$

regularized fixed-point

$\hat{u}$: $\quad Fu = y \qquad F = A + G$

$$A^* A u_{k+1} = A^*(y - G u_k)$$

regularized fixed-point

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$$u_{k+1} = (A^* A)^\dagger A^* (y - G u_k)$$

regularized fixed-point

$\hat{u}$: $\quad Fu = y \qquad F = A + G$

$$u_{k+1} = (A^*A)^\dagger A^*(y - Gu_k)$$

$$u^\alpha_{k+1} = g_\alpha(A^*A)A^*(y_\delta - Gu_k)$$

regularized fixed-point

$\hat{u}$: $\qquad Fu = y \qquad F = A + G$

$$u_{k+1} = (A^*A)^\dagger A^*(y - Gu_k)$$

$$u^\alpha_{k+1} = g_\alpha(A^*A)A^*(y_\delta - Gu_k)$$

$$\|\hat{u} - u^\alpha_{k+1}\| \leq \varphi(\alpha) + \frac{\delta}{\lambda(\alpha)} + \rho\|\hat{u} - u_k\|$$

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balancing principle

$$\|\hat{u} - u^{\alpha}\| \leq \varphi(\alpha) + \frac{\delta}{\lambda(\alpha)}$$

$$\Delta = \{\alpha_i,\ i = 1, \dots, N\}$$

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$$i_{\text{opt}} = \max\left\{ i \middle|\ \|u^{\alpha_i} - u^{\alpha_j}\| \leq \frac{4\delta}{\lambda(\alpha_j)},\ j = 1, \ldots, (i-1) \right\}$$

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$$\|\hat{u} - u^{\alpha_{i_{\text{opt}}}}\| \leq b(\delta)$$

balancing principle

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balancing principle

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Hui Cao
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