

Lecture 27

Q: Final Exam

Q: Is Multigrid

Easier in

- 1d
- 2d
- 3d
- 4d
- ?

Explain AMG. II

Is a "not good" inverse solver a preconditioner?

How to pre- a preconditioner on the problem?

Can you deflate to find the 2nd smallest λ -val? Largest " "

Yes! It's called deflation.

Use Gerschgorin Disks to find rank? / check singularity?

Then 10.5 in am 1 p.

V vs W Cycle?

Find K^R largest / 0 others?

id

0.0-0.0-0.0

as

Multigrid

linear solver

Multigrid

2d

1/4 H

1/8 H

1/16 H

1/32 H

1/64 H

1/128 H

1/256 H

1/512 H

1/1024 H

1/2048 H

1/4096 H

3d

1/8 H

1/16 H

1/32 H

1/64 H

1/128 H

1/256 H

1/512 H

1/1024 H

1/2048 H

1/4096 H

1/8192 H

1/16384 H

Is a not good inverse solver a preconditioner?

Yes! Maybe

But, it may not be effective.

Does it "constrain"?

i.e. is there a matrix P s.t.

$AP \approx P^T A$

for some X ?

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Picking a preconditioner (SPD)

- 2d 3d

"geometry-like" / "spatial" problem

$\Rightarrow$ use Multigrid!

- Else, use incomplete Cholesky

if as much fill as you can afford!

(drop tol 10^{-4})

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