Reliability, Error Bounds, and Trust

breakout session overview

Inaugural Midwest RandNLA Workshop

Discussion with Stephen Becker, Joshua Cape, Chao Chen, Longfei Gao, Max Melnichenko, **Raphael Meyer**, Riley Murray, Garvesh Raskutti, and Jiaming Yang

“Reliability, Error Bounds, and Trust”

How do we convince other people to use our randomized algorithms?

1. Build trust in our methods
2. Make it easy to use our methods

We need to build trust

Trust is a weird thing.

Some areas trust randomized algorithms, some don't

Trust ≠ Determinstic

$svds()$ in MATLAB is pretty well trusted...

1. Package it in a library.
2. Make sure it runs well.
3. Give error estimates
4. Get domain-specific. *(Verification & Validation; uncertainty is banal)*

Things we should make

0. The foundation already exists!
1. A survey article on a posteriori error estimation
   - Lots of methods exist!
   - Forwards and backwards error
   - Goal: Reliable resource for looking up the best-known methods
2. Code that's easy to use without thinking about it
   - Put it in a library
   - Make that library easy to use
   - (Improv something based on Rylie and Nathaniel's talks)
3. More basic research