Our Results

- **Theorem**: For $0 < p < 2$, can approximate $F_p(x)$ up to $1 \pm \varepsilon$ using $\varepsilon^{-2} \log d$ bits of space and $O(\log d)$ update time
  - Valid only for $\varepsilon < 1/d^c$
  - Improves on $O(\log^2 d \log\log d)$ update time of [KNPW '11]
- Many other results for CountSketch, $\|x\|_\infty$ estimation etc.

Main Ideas

- PRGs used to derandomize streaming algorithms ⇒ slow update times
- A new PRG with a symmetry property and space-time tradeoff
- Carefully analyze which parts of existing algorithms need to be derandomized
    - Symmetry of the PRG lets us derandomize CountSketch with small space
    - Space-vs-time tradeoff lets us get fast update times!