Veedub H4X

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Low Rank Quadratic Features

- Recall `-q ab`:

    ```
    1 |a deep |b learning
    0 |a everything |b else
    ```

- Problems if a and b have large cardinality.
    - Computational <u>and</u> statistical difficulties.
- Problems if every combination of a and b is unique.
    - Recommendation systems: issues!
- One strategy: low-rank constraint.

Low Rank Quadratic Features

- New thing `--lrq abk`:

    ```
    1 |a deep |b learning
    0 |a everything |b else
    ```

- Ok if a and b have large cardinality.
    - Computational <u>and</u> statistical benefits.
- Ok if every combination of a and b is unique.
    - Recommendation systems: works great.
- Drawback: non-convex optimization.

LRQ: non-convex implications

- Only works with online learning (but multicore . . .).
- Requires tuning (-l, --l2).
  - Less finicky due to importance weighted updates.
- Bonus: --lrqdropout is shockingly effective.
- Don't use --normalized.
- --adaptive typically unproductive.

Hogwild mode

- Originally for `--lrq` but should generally work.
- (Ab)uses existing `--daemon` mode.
- Send data to workers via sockets.

Demo

- Shout-out to libFM.
- 'nuff said.