Automatic Polynomial Expansions

What?

- `vw` can build polynomial decision surfaces:

$$x \mapsto 2 \cdot \mathbb{1}[x_1 x_2 - 3x_1 x_4 x_5 + 7x_2 x_4 x_9 \geq 0] - 1.$$

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- Just add `--stage_poly` to your command line.

Why?

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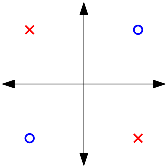

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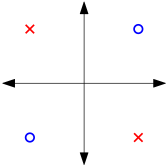

- `vw` already had (manual) polynomials of low degree:

```
vw -q ff (..)
vw --cubic fff (..)
```

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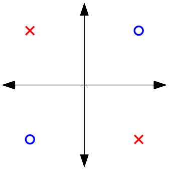

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- `--stage_poly` vs. `--ksvm`: different bias.

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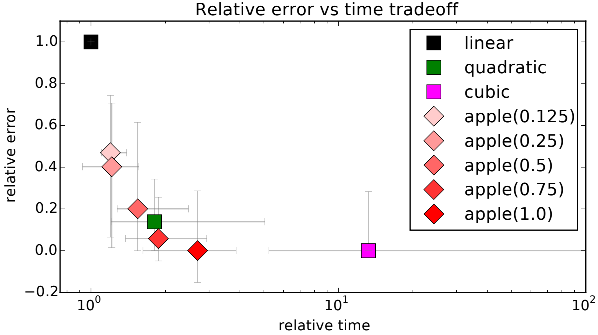

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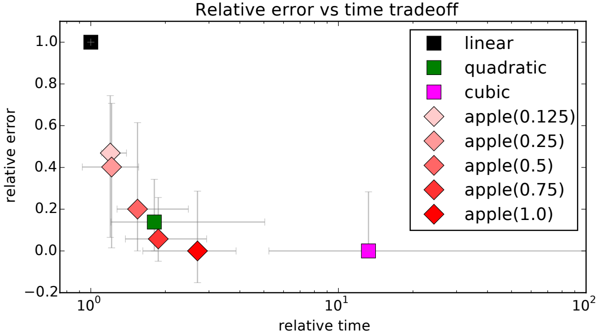

More Info. NIPS 2014:

`Scalable Nonlinear Learning with Adaptive Polynomial Expansions. Alekh Agarwal, Alina Beygelzimer, Daniel Hsu, John Langford, Matus Telgarsky.`

Usage

```
--stage_poly
```

Usage

```
--stage_poly
```

```
--sched_exponent arg1
```

Usage

```
--stage_poly

--sched_exponent arg1

--batch_sz arg2
```

Usage

```
--stage_poly

--sched_exponent arg1

--batch_sz arg2

--batch_sz_no_doubling
```

Hacking

- Different types of features.

Hacking

- Different types of features.
- Different support search.

More info @ github wiki & NIPS paper.

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