AI at the Webscale Project Results

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Approach

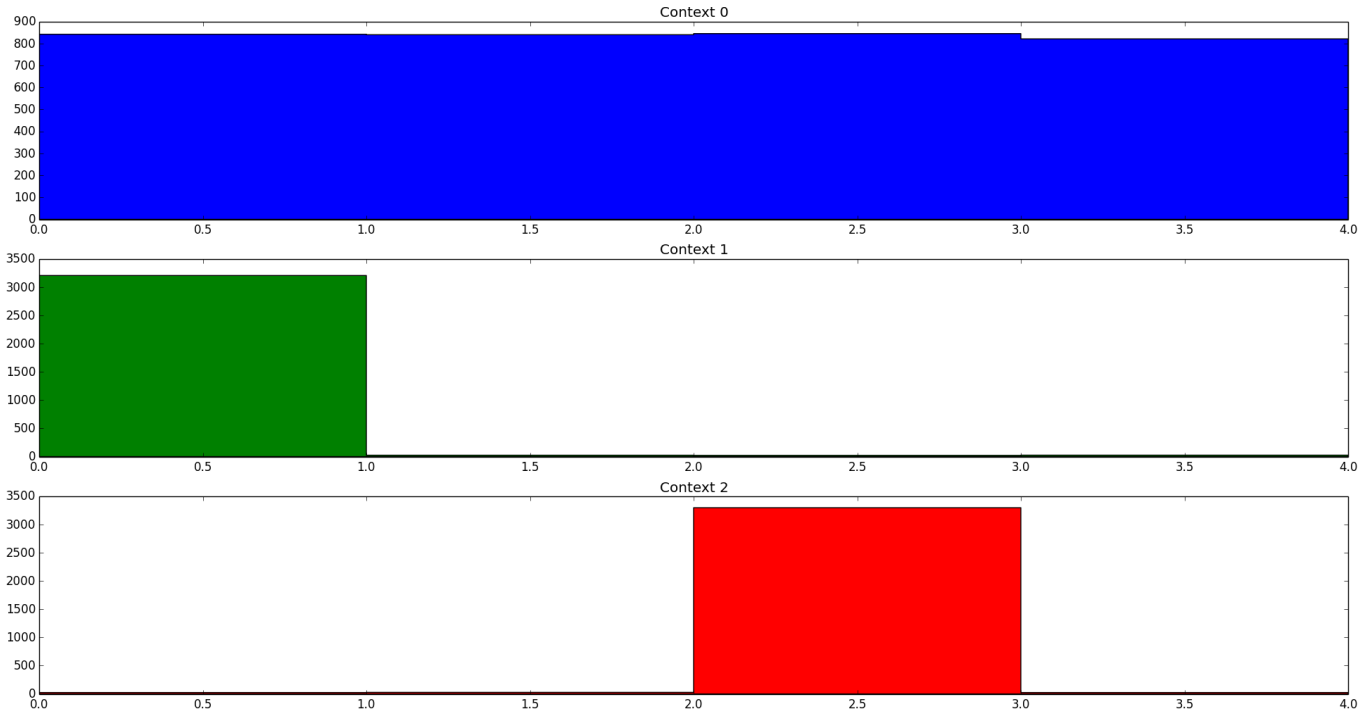
- Epsilon-greedy
- Gibbs-sampling
- Thompson-sampling

Model

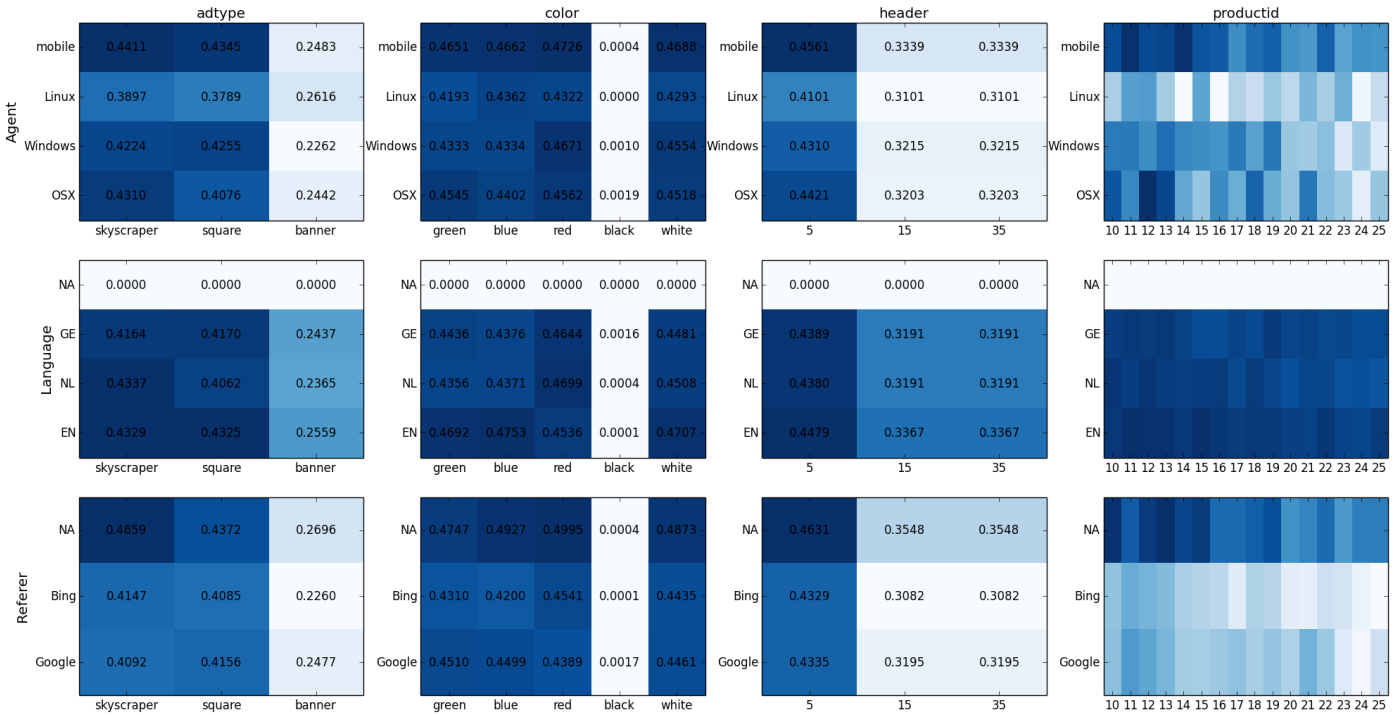
$$r = \beta_0 + \beta_{x_1} c_1 + \ldots + \beta_{x_k} c_k + \beta_{y_1} a_1 + \ldots + \beta_{y_l} a_l + \beta_{z_1} c_1 a_1 + \ldots + \beta_{z_m} c_k a_l$$

- Reward for update: use price · effect instead of effect

Visualization



Visualization



Misc. Improvements

- Price: Maximize polynomial: $\beta_0 + \beta_1 \cdot p + \beta_2 \cdot p^2$
- Multivariate Gaussian speedup: use Cholesky transformation
- Predict 5000 random pages to give model 'warm start' before doing actual predictions.
- Userid: add extra features: average price user paid previously, if user has bought anything previously

Results

- Average reward: 20.0605
- Standard deviation: 24.507
- Time taken: 1:25 per runId
- Any questions?