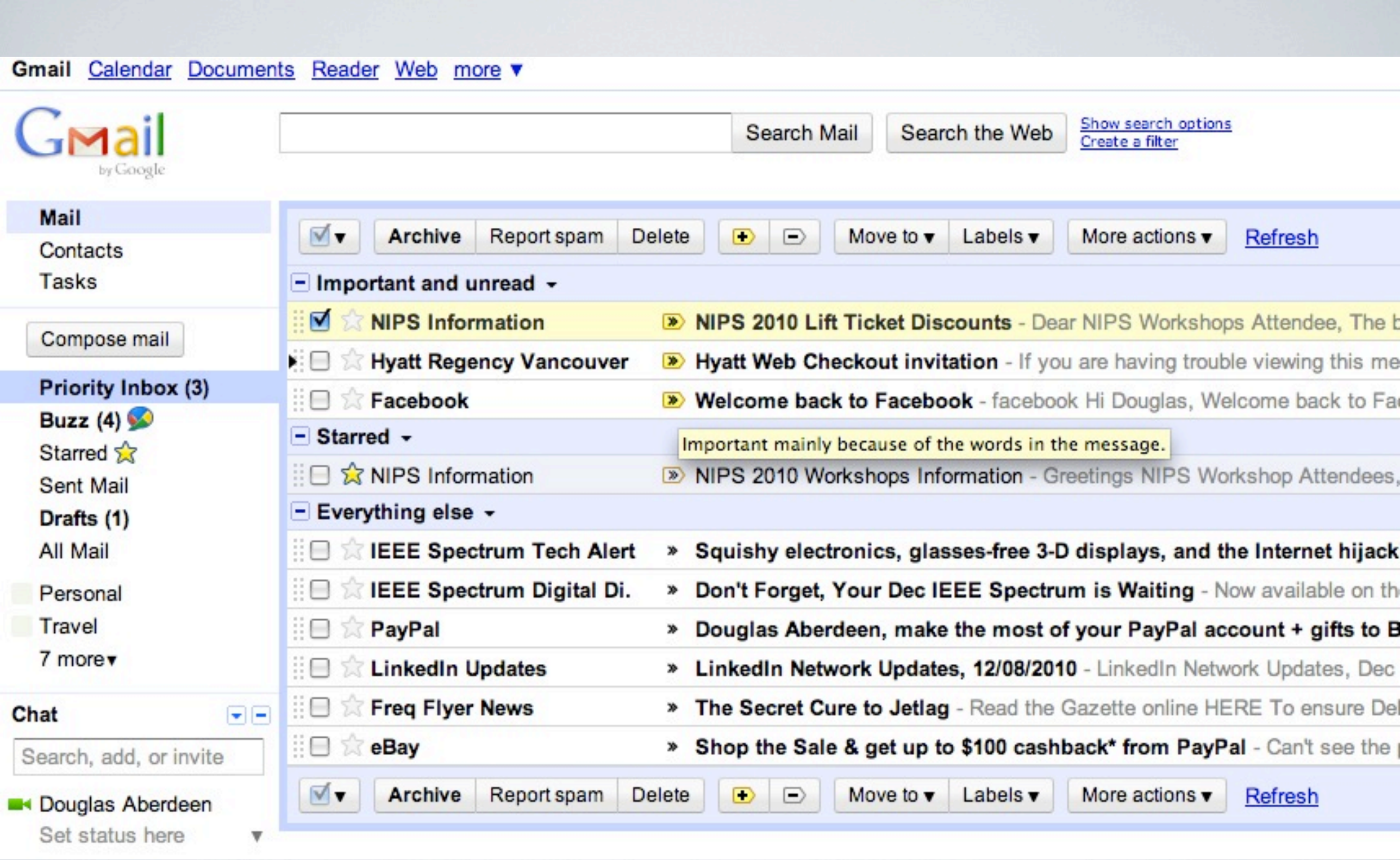


Try it out from the Priority Inbox settings tab.

Doug Aberdeen, Ondřej Pacovský, Andrew Slater

PASSIVE-AGGRESSIVE LOGISTIC REGRESSION

- Crammer, Dekel, Keshet, Shalev-Shwartz, Singer: "*Online Passive-Aggressive Algorithms*", 2006

$$e = \begin{cases} 1 - p & \text{if important;} \\ -p & \text{otherwise.} \end{cases}$$

$$w_i \leftarrow w_i + f_i \frac{\max(e - \epsilon, 0)}{\|\mathbf{f}\|^2 + \frac{1}{2\lambda}}$$

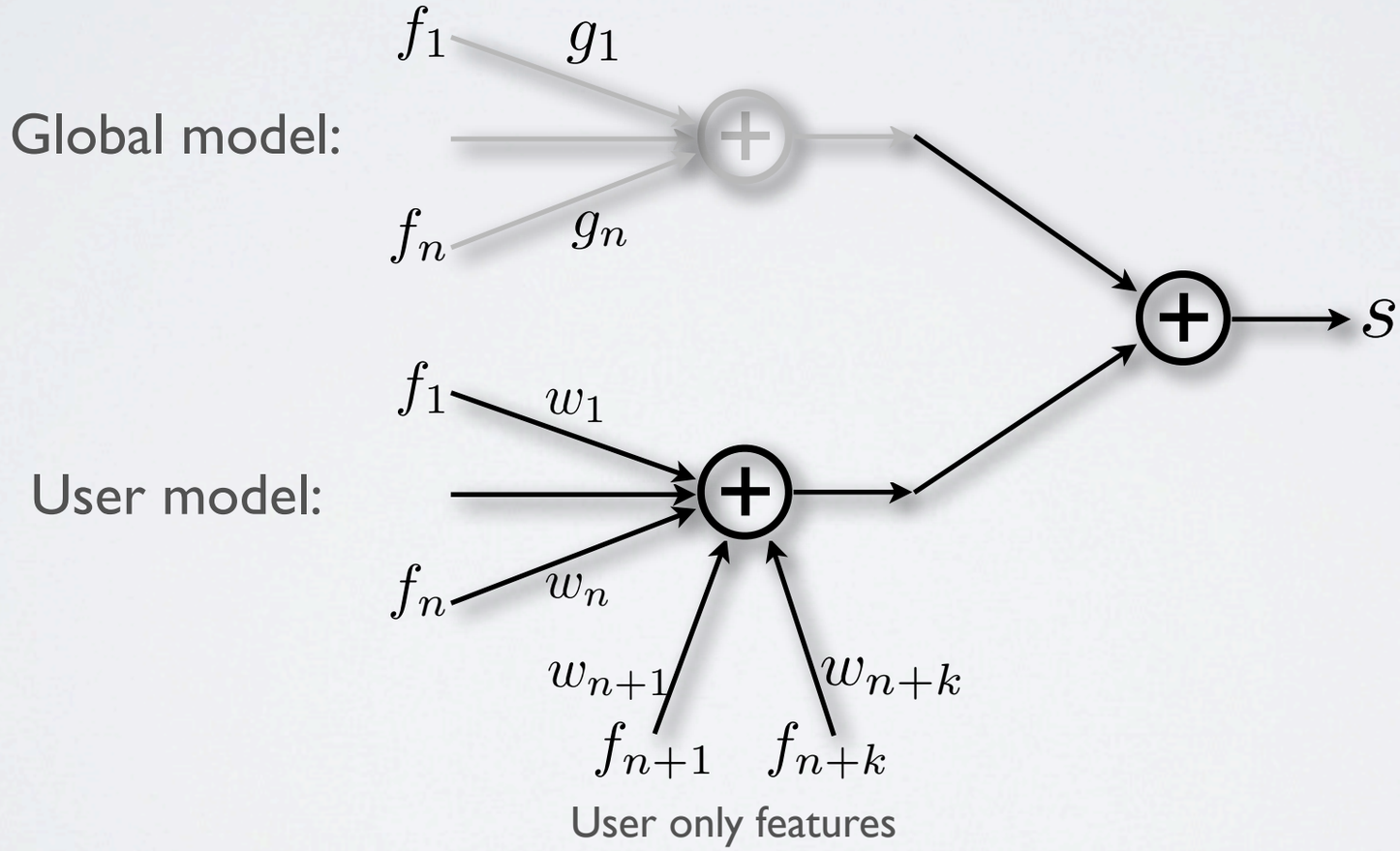
- A message is important if it's read/replied/starred/marked within a time limit.

- **λ** is a regularisation parameter that controls "aggressiveness".

- **ε** is the "passiveness", related to the hinge loss.

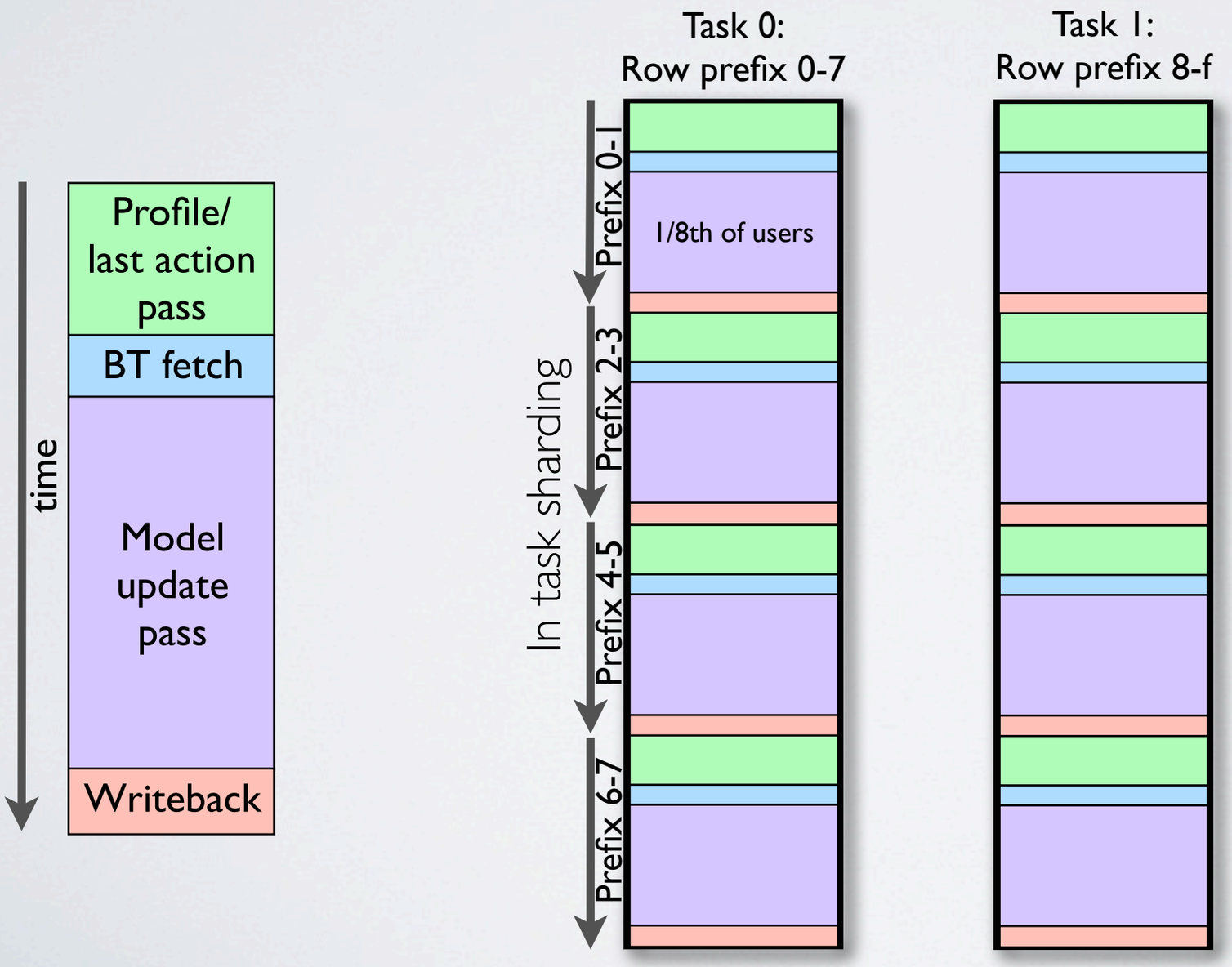
SIMPLE TRANSFER LEARNING

- **Glut** of data globally**, dearth** of data per user.



SCALING

Row key prefix is user ID.
But fast Bigtable reads are not in row order!



~100k users per shard.

20 -- 30k f/sec/core.

Why not map-reduce?

FEATURES

~200 global features + personal

Social features

Content features

Thread features

Label features

Spam features