New Algorithms

Premises:

[1] The votes of new/newer users should have minimal impact on the "movement"of the blogger orientation, since the users' own orientations have not been well established yet.

[2] On the other hand, the new users' initial votes should have a rather large impact on their own orientation. For example, if a new user strongly disagreed with a blog article which was established to be highly conservative, the new user's orientation should go from a default '0' to something in the highly liberal side...

[3] A user's own political orientation moves less with each additional vote he makes (i.e., the more he votes, the more "stable" his political orientation becomes) .

[4] As a user's political orientation becomes more established (e.g., from voting a lot), his ability to impact the "movement" of a blogger's orientation becomes greater...

Proposed Revision to Part 2: Blogger Orientation Calculation

Formerly, we had:

$$o_b = \frac{\sum V + s}{1 + \sum W}$$

where

$W = |w|$ (i.e., the absolute value of a vote, where $-2 \le w \le 2$),

o_b = orientation of blogger; $-100 \le o_b \le 100$

o_u = orientation of user; $-100 \le o_u \le 100$

s = admin seed: positive for right side of political spectrum; negative for left

w = actual vote given by user (-2, -1, 0, 1, 2)

V = adjusted vote value = $o_u \cdot w$

V_L is an adjusted vote value that is negative

V_R is an adjusted vote value that is positive

L = sum of all negative adjusted vote values = $\sum V_L + \min(s,0)$

R = sum of all positive adjusted vote values = $\sum V_R + \max(s,0)$

I still like the above equation because it is an average of data, meaning that the more votes the blog article already has, the less movement a single voter can effect on the blog orientation. I.e., the more data we have on a blogger, the more likely his current political orientation value is already correct, and one aberrant vote will be less prone to "move" this orientation.

The converse is good too: The less data we have on a blogger, the more likely his current political orientation value is not quite accurate, and we want to get the orientation to move over to its "correct" position as quickly as possible. With the above equation, this can be accomplished: i.e., an additional vote can "move" the orientation a lot when there are not many existing votes on the blogger's articles.

The issue we want to address here is to ensure that new voters -- whose own orientations are not very "stable" yet -- cannot change the blogger's orientations very much in any case. We also want well-established voters to be able to move a blogger's orientation a lot, at least when the blogger's orientation is unstable.

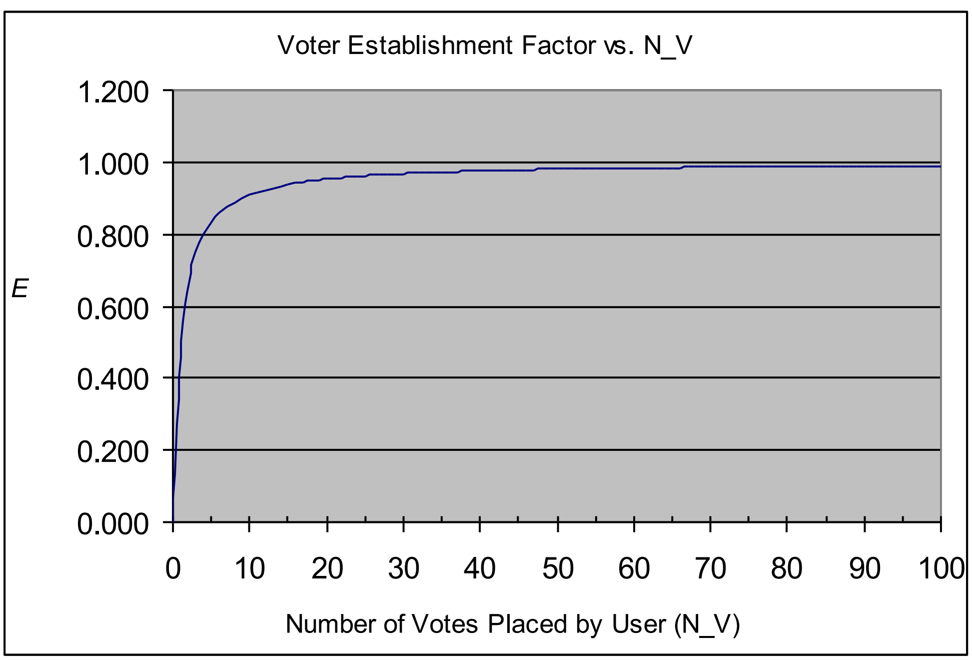
To achieve this (basically, to achieve Premises [1] and [4] above), I propose introducing Establishment Factor E:

$$E = 1 - \frac{1}{1 + N_V}$$

where

N_V = number of votes the voter has made since registering with the site

If the voter is new and has not placed any votes, $E = 1 - \frac{1}{1+0} = 0$. On the other hand, when the voter's orientation is well-established because he voted a lot, Establishment Factor E approximates 1.



We then introduce E into the original equation for o_b:

$$o_b = \frac{\sum(E \cdot V) + s}{1 + \sum(E \cdot W)} = \frac{\sum(E \cdot o_u \cdot w) + s}{1 + \sum(E \cdot |w|)}$$

With this equation, a vote by a brand-new user (no previous votes) will not change the blogger orientation at all, whereas a well-established voter will have the maximum ability to do so (at least when the number of other votes -- which correlates with $\sum W$ -- is still small).

Proposed Revisions to Part 3: User Orientation Calculation

Previously, our equations for calculating user orientation were:

If ($w > 0$),

then $o_\Delta = \dfrac{F \cdot w \cdot (o_b - o_u)}{200}$

If ($w < 0$ AND $X < 0$),

then $o_\Delta = -F \cdot w \cdot \left(\dfrac{o_b - o_u}{200} + 1 \right)$

If ($w < 0$ AND $X > 0$),

then $o_\Delta = -F \cdot w \cdot \left(\dfrac{o_b - o_u}{200} - 1 \right)$

$o_{u,new} = o_u + o_\Delta$ (by definition)

Unfortunately, these equations do not satisfy Premises [2] and [3] (from the top of the document) because the change in user orientation, o_Δ, does not take into consideration how many times the voter has voted (which directly corresponds with how stable/correct his political orientation is).

For example, say a user of orientation 0 (neutral) agreed with an article of a very conservative blogger (say, 100). If the user had not voted before, then our best guess would be that the user is very conservative and his orientation should move a lot to the right. If the user HAD voted a lot before and we had determined his orientation was still 0, then even though he agreed with this one conservative blogger, we would still think he is fairly neutral, and his political orientation should maybe only move a little bit to the right. According to the above equations, however, the orientation shift would be the same in both cases.

What we need is some sort of averaging scheme akin to what we had done in Part 2 for the Blogger Orientation Calculation. I propose:

$o_u = 0$ when $\sum |w| = 0$ (i.e., in the cases of when the user has never voted, or has voted neutrally every single time)

and

$$o_u = \frac{\sum (o_b \cdot w)}{\sum |w|} \text{ when } \sum |w| \neq 0$$

Using the above equation, if a user votes for the first time, and he strongly agrees ($w = 2$) with the article he voted on, then $o_u = o_b$. This is fine; if we only have this one piece of data on the user, that he strong agrees with this one blogger's article, then our best guess (until we get more data) is that his orientation is the same as the blogger's.

Note, however, with the above equation, if the user votes for the first time and he only moderately agrees (i.e. $w = 1$) with the article he voted on, then $o_u = o_b$ too. At first this may seem wrong but actually this also is appropriate. This is because we do not know if the user only moderately agrees because he is more liberal or conservative than the blogger; all we can say with some certainty is that they are on the same side of the political spectrum. Hence, $o_u = o_b$ is our "best" guess for now, pending more data.

When $w = -1$ or $w = -2$, then for the first vote $o_u = -o_b$. That is fair enough because all we can safely conclude from either of those votes (-1 or -2) is that the user is on the opposite side of the political spectrum from the blogger.

The beauty of the above equation is that the "strong" votes ($w = -2$ or $w = +2$) count more in the averaging when more than one vote is acquired by the blogger**.** I.e., they are essentially 2 votes in the equation (since the denominator is $\sum |w|$) whereas the less strong votes ($w = -1$ or $w = +1$) are in essence 1 vote.

It would be a good idea to put in an Establishment Factor for the above as we did in Part 2 for the Blogger Orientation equation. The equation for E can even be exactly the same, but N_V would be the amount of votes a blogger received in this case:

$$E = 1 - \frac{1}{1 + N_V}$$

Introducing *E* into the equation, we get:

$$o_u = \frac{\sum \left(E \cdot o_b \cdot w \right)}{\sum \left(E \cdot |w| \right)} \text{ when } \sum |w| \neq 0$$

Note that this equation is almost identical to the Blogger Orientation equation in Part 2 except that there is no seeding.