APPENDIX E

Correlation Coefficient

We calculated the Pearson correlation coefficient to indicate the correlations between the reward values calculated using our approach, and the page view metric, extracted from the Google Analytics account. Table 1 shows the Pearson correlation coefficient matrix of reward values of the extractor functions and page views for two months of January and March determined with R1 and R2, respectively.

R1 and R2 indicate the positive correlation between the two variables is statistically significant especially in Word-3, Word-1 and character-based methods which are 0.9115, 0.8850 and 0. 8606 for January and 0.9162, 0.8804 and 0.8672; for March, respectively. However, the correlation coefficient between the rewards based on Word-3 and the Google Analytics' page views has the best result amongst the other extractors. This result again shows the importance of calculating reward values in user behavioral models especially in the cases that Google Analytics data does not exist or is not available.

Fig. 1 depicts the Pearson coefficients of two polynomials that fit into two sets of data (reward values calculated using our proposed approach, and the page views, extracted from the Google analytics account). This figure shows the Pearson correlations between Google Analytics' page views and character-based, visual based, Word-1, Word-2 and Word-3 reward's extractors in MyUalberta application in January, respectively. It is illustrated that there is a strong correlation between the Word-3 extractor reward values and Google Analytics' page views.

The Pearson correlation of variables during March is shown in Fig. 2. It depicts the correlation among pairs of variables between page views and character-based, visual based, Word-1, Word-2 and Word-3 reward's extractors in MyUalberta application, respectively. As it is shown, the strong correlation between the rewards and the Google Analytics' page views is represented in the curve based on the Word-3.

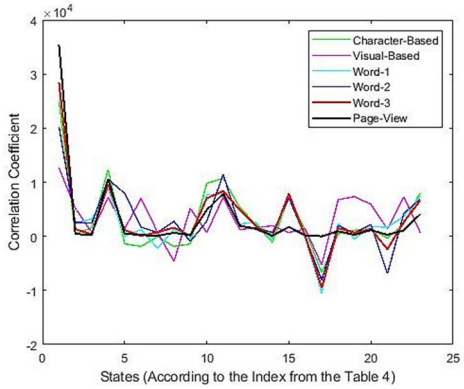

Fig. 1. Pearson Correlations among Pairs of Variables in MyUalberta Study Instance in January

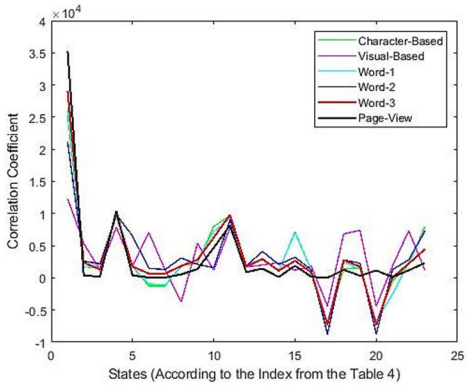

Fig. 2. Pearson Correlations among Pairs of Variables in MyUalberta Case Study during March

TABLE 1
PEARSON CORRELATION COEFFICIENT MATRIX

PEARSON CORRELATION COEFFICIENT	CHARACTER-BASED	VISUAL-BASED	WORD-1	WORD- 2	WORD-3
$R1\ (January)$	$\begin{pmatrix} 1 & 0.8606 \\ 0.8606 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0.5543 \\ 0.5543 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0.8850 \\ 0.8850 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0.7801 \\ 0.7801 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0.9115 \\ 0.9115 & 1 \end{pmatrix}$
$R2\ (March)$	$\begin{pmatrix} 1 & 0.8672 \\ 0.8672 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0.5716 \\ 0.5716 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0.8804 \\ 0.8804 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0.7751 \\ 0.7751 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0.9162 \\ 0.9162 & 1 \end{pmatrix}$