we averaged the percentage of rumors in our list that they had correctly identified. Figure 3 shows the mean, and the standard deviation of each of the five groups. There was a statistically significant difference between groups as determined by one-way ANOVA ($F(4, 20) = 11.283, p < .001$). There are three interesting conclusions that one can draw from these results. First, the groups using all versions of our tool outperformed the control group significantly, with the best performing group outperforming the control group by 76%. Second, Louvain based clustering outperformed HAC, both when combine with assertion filtering (by 9%) and when not (by 15%). Second, assertion filtering improved the performance of both Louvain (by 16%) and HAC clustering (by 21%). The best performing tool was the one that combined assertion filtering with Louvain based clustering. Using that tool, the subjects were able to correctly identify 81% of the rumors in five minutes. Though, somewhat simple, this experiment highlights the advantages of our tool, compared to other more conventional methods.
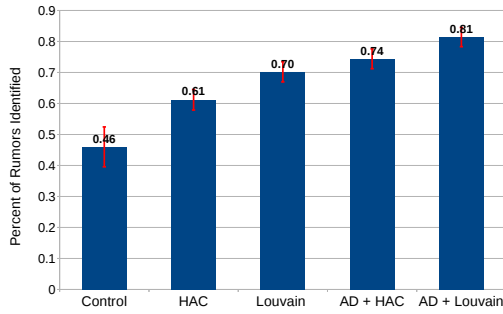

Figure 3: Percentage of rumors correctly identified by subjects, using five different version of our tool.

Analysis 2   Next, we quantitatively measured the quality of the clusters that are produced by HAC and Louvain clustering methods. For this analysis, we used the same dataset as the first analysis, except we did not mix in random tweets, thus we had a total of 6,825 tweets about 21 different rumors, across 3 events. We ran HAC and Louvain on the dataset and cut the generated trees so that there would be 21 clusters (same as the number of rumors). We then used the adjusted RAND index (**?**) and adjusted mutual information score (**?**)–both measures that score the similarity between two data clusterings–two compare the 21 ground-truth rumor clusters to the clusters produced by HAC and Louvain. Table 1 shows the results. The results are quantitative confirmation that the Louvain is superior to HAC.

	Adjusted RAND	Adjusted MI
HAC	0.14	0.19
Louvain	0.25	0.31

Table 1: Adjusted RAND and Mutual Information scores for HAC and Louvain clustering methods.

Conclusions

In this paper, we presented a semi-automatic tool that can be used to efficiently identify stories about real-world events on Twitter. This is an important problem since Twitter and other social media platforms have become one of the main sources of news for many people. Given a user-specified query about an event, our tool automatically detects and clusters assertions about that event on Twitter. The system uses a Twitter speech-act classifier, in conjunction with a novel hierarchical clustering method for tweets. Instead of relying on traditional hierarchical methods which perform poorly on tweets, our method works by first creating a similarity graph of tweets (using recent advances in Twitter NLP tools) and then applying a very fast community detection algorithm on the graph. The system is not only faster, but it also provides higher quality clusters (less noisy and more coherent), making it easier for users to quickly sort through thousands of tweets.

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