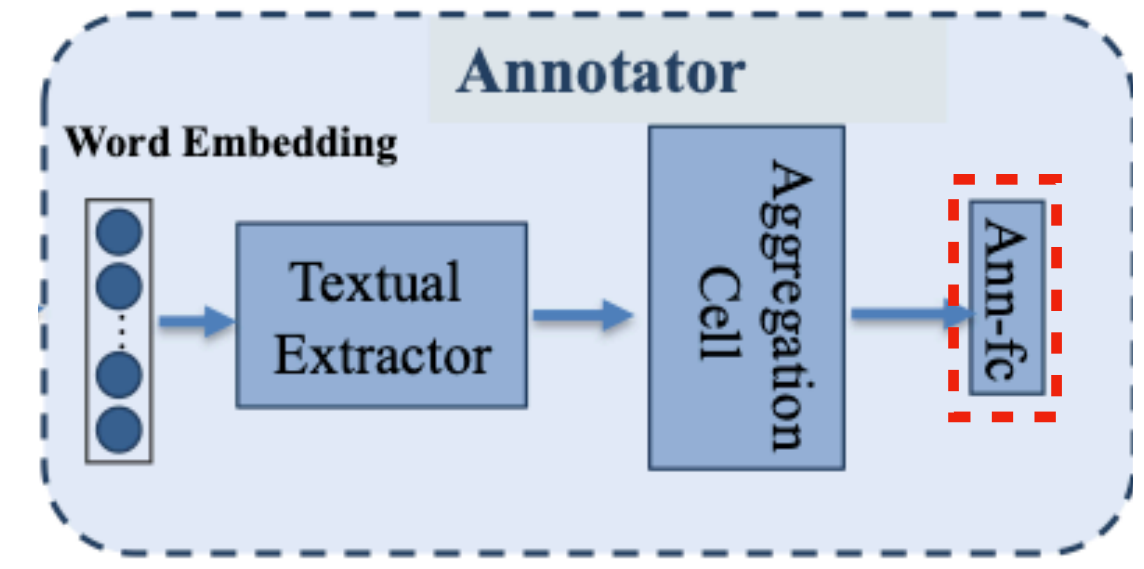


Methodology

Automatic Annotation based on Reports

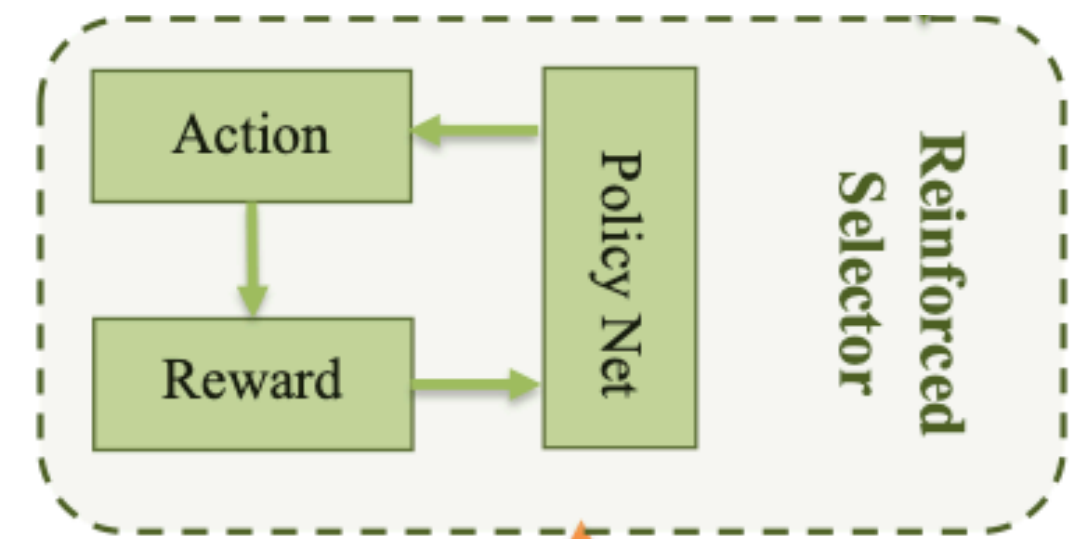


- Feed $\mathbf{h}^{(i)}$ into the fully connected layer, denoted as Ann-fc, to output the corresponding probability of the i -th sample being a fake one
 - $D_r(R^{(i)}; \theta_r)$, θ_r : all parameters of the annotator and corresponding textual feature extractor
- Entire report message dataset $R = \{R^{(1)}, R^{(2)}, \dots, R^{(|R|)}\}$, $|R|$: number of report sets
- Corresponding ground truth labels of news $Y = \{y^{(1)}, y^{(2)}, \dots, y^{(|R|)}\}$
- Loss function for the proposed annotator is defined by cross entropy as follows:

$$L_r(R, Y; \theta_r) = -\frac{1}{|R|} \sum_{i=1}^{|R|} \left[y^{(i)} \log D_r(R^{(i)}; \theta_r) + (1 - y^{(i)}) \log (1 - D_r(R^{(i)}; \theta_r)) \right]$$

Methodology

Data Selection via Reinforcement Learning



- The criteria of the selection is based on whether adding the chosen sample can improve the fake news detection performance
 - Design a performance-driven data selection method using reinforcement learning mechanism.
- \tilde{X} : all the input data of the proposed reinforced data selector
- Instead of directly putting the entire dataset \tilde{X} into the selector, divide \tilde{X} into K small bags of data examples: $\tilde{X} = \{\tilde{X}^{(k)}\}_{k=1}^K$
- For the k -th bag of data contains B samples: $\tilde{X}^{(k)} = \{x_1^{(k)}, x_2^{(k)}, \dots, x_B^{(k)}\}$
- Using multiple small bags of samples can provide more feedback to selector and makes the training procedure of reinforcement learning more efficient