Methodology

Modal-independent Fake News Detection

- To properly represent news textual and visual information in predicting fake news, we aim to correctly map the extracted textual and visual features of news content to their possibilities of being fake, and further to their actual labels.
  - Possibilities can be computed by $M_p(t, v) = 1 \cdot \text{softmax}(W_p(t \oplus v) + b_p)$
    - $1 = [1,0]^T$, $W_p \in \mathbb{R}^{2 \times 2d}$ and $b_p \in \mathbb{R}^2$ are parameters to be trained.
- Cross-entropy-based loss function:
  - $L_p(\theta_t, \theta_v, \theta_p) = -\mathbb{E}_{(a,y)\sim(A,Y)}(y \log M_p(t, v) + (1 - y)\log(1 - M_p(t, v)))$

Methodology

Cross-modal Similarity Extraction

- Most method are considered two different modal features (t, v) separately
  - Just concatenating them with no relation between them explored
- However, besides that, the falsity of a news article can be also detected by assessing how (ir)relevant the textual information is compared to its visual information
- Fake news creators sometimes actively use irrelevant image for false statements to attract readers' attention, or passively use them due to the difficulty in finding a supportive non-manipulated image.