

# Generative Entity-to-Entity Stance Detection with Knowledge Graph Augmentation

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## Entity-to-Entity (E2E) Stance Detection

**Existing Stance Detection:** Only focus on author's overall sentiment towards a given entity or topic.

**E2E Stance Detection:** Given a target sentence and its surrounding context, extract a sequence of stance triplets that can be inferred from the input.

**New Challenges Posed:**

- Entities can be involved in multiple and even conflicting sentiments within a sentence.
- Entities are mentioned in various forms. Simply extracting the mentions would cause ambiguity.

Trump's rhetoric, including calling Central Americans trying to enter the United States "an invasion," and his hard-line immigration policies have exposed him to condemnation since the El Paso shooting. "How far is it from Trump's saying this 'is an invasion' to the shooter in El Paso declaring 'his attack is a response to the Hispanic invasion of Texas?' Not far at all," Biden was due to say, according to an advance copy of his speech. "In both clear language and in code, this president has fanned the flames of white supremacy in this nation."

[0] Joe Biden NEG Donald Trump  
[1] Joe Biden NEG white supremacy  
[2] Donald Trump POS white supremacy

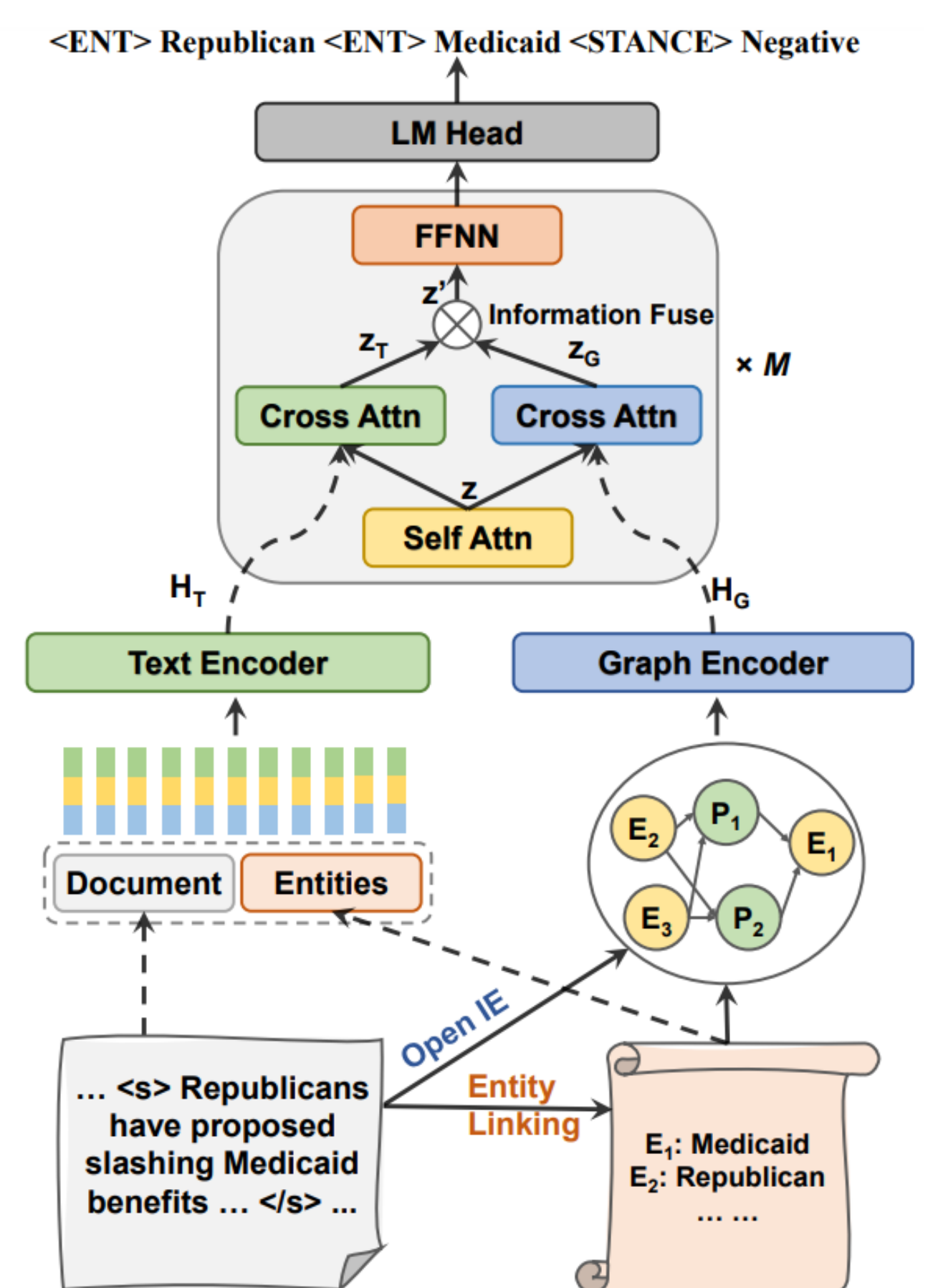
Sample stance triplet annotations for a target sentence. Entities annotated in canonical names.

## SEESAW

Stories count:	203
Articles count:	609
Articles length:	647 words, 28 sentences
Target Sentence length:	30.3 words
Outlets coverage:	24 (9 Left, 6 Center, 9 Right)
Topics count:	52 (E.g., Election, Immigration)
Distinct entities count:	1,757 (E.g., Donald Trump, Joe Biden, Hillary Clinton)
Annotations count:	10,619 (37.6% positive v.s. 62.4% negative)
Time range:	2012 - 2021
Quality:	97% agreement on stances

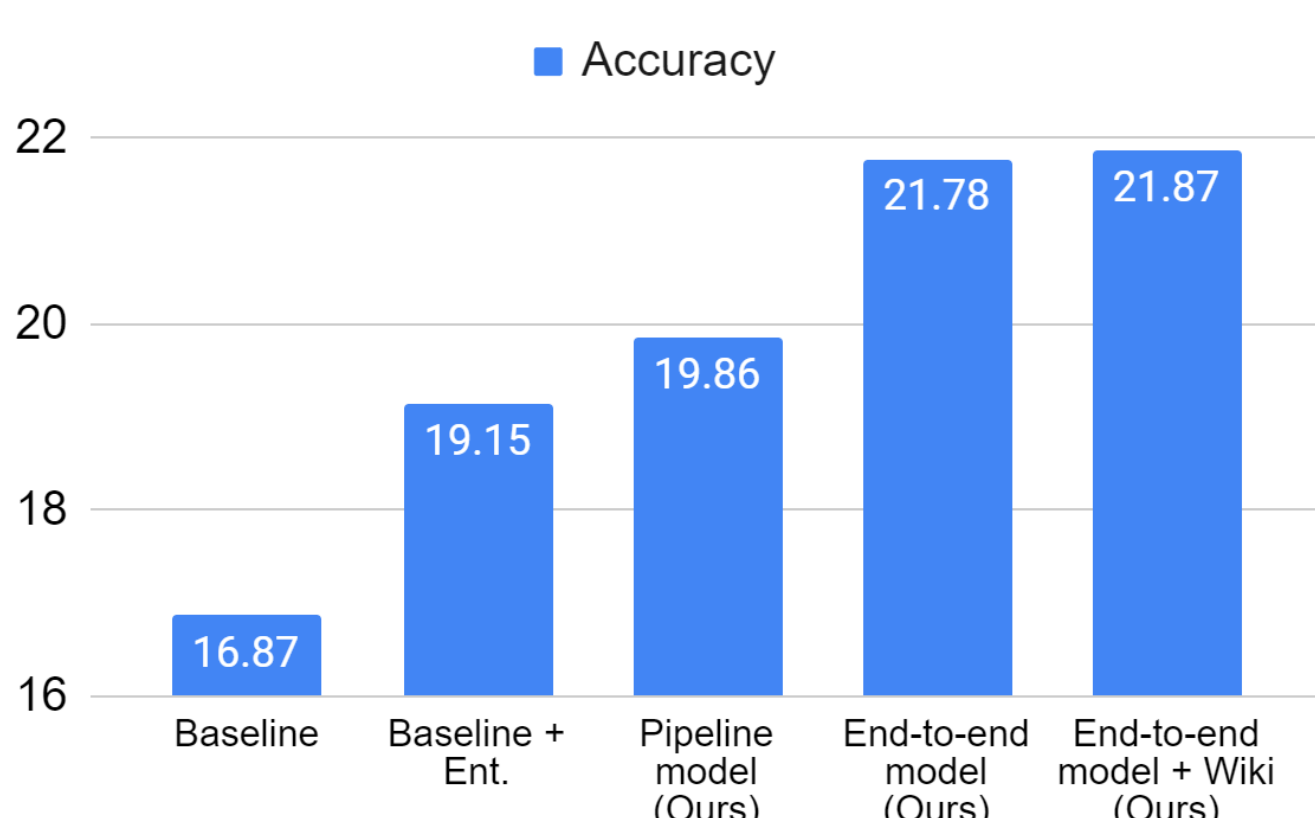
Basic statistics of SEESAW dataset. SEESAW is annotated on news stories collected in AllSides. For a balanced view, each news story consists of 3 articles reported by media of different ideology.

## Modeling

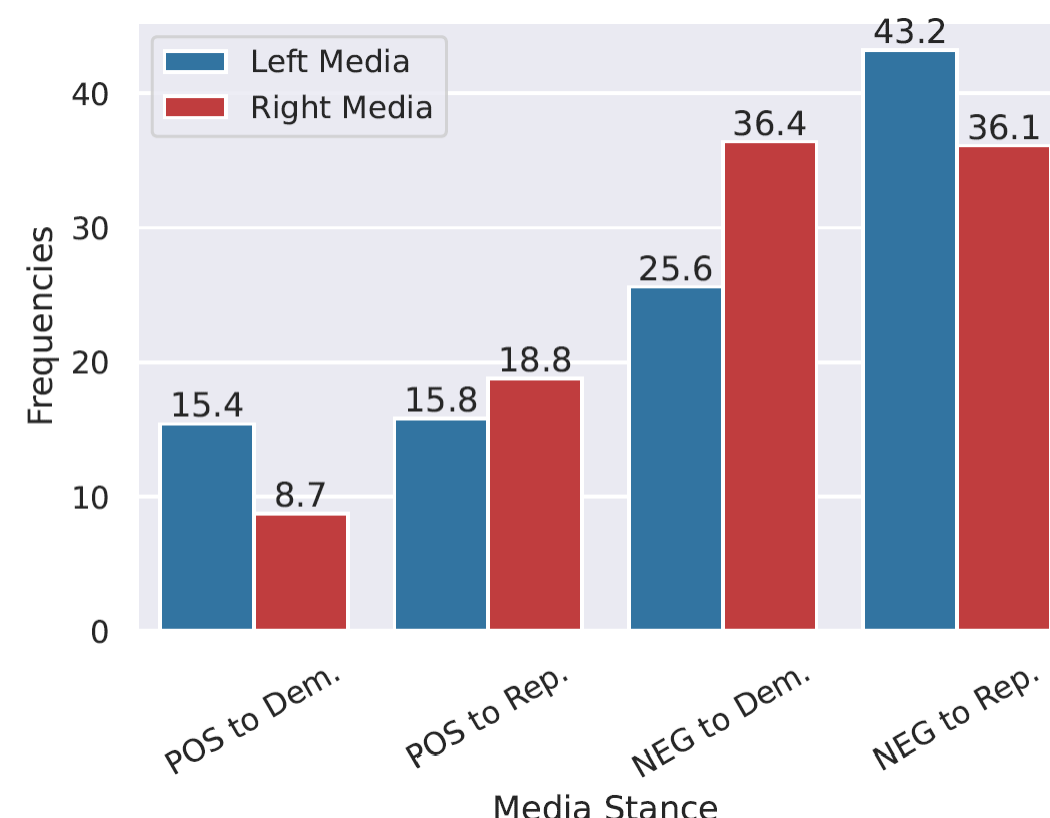


Overview of our end-to-end generative framework for stance detection. Our model reads a document  $x$ , on which we construct a semantic graph  $G$ . Our decoder implements in-parallel cross-attention.

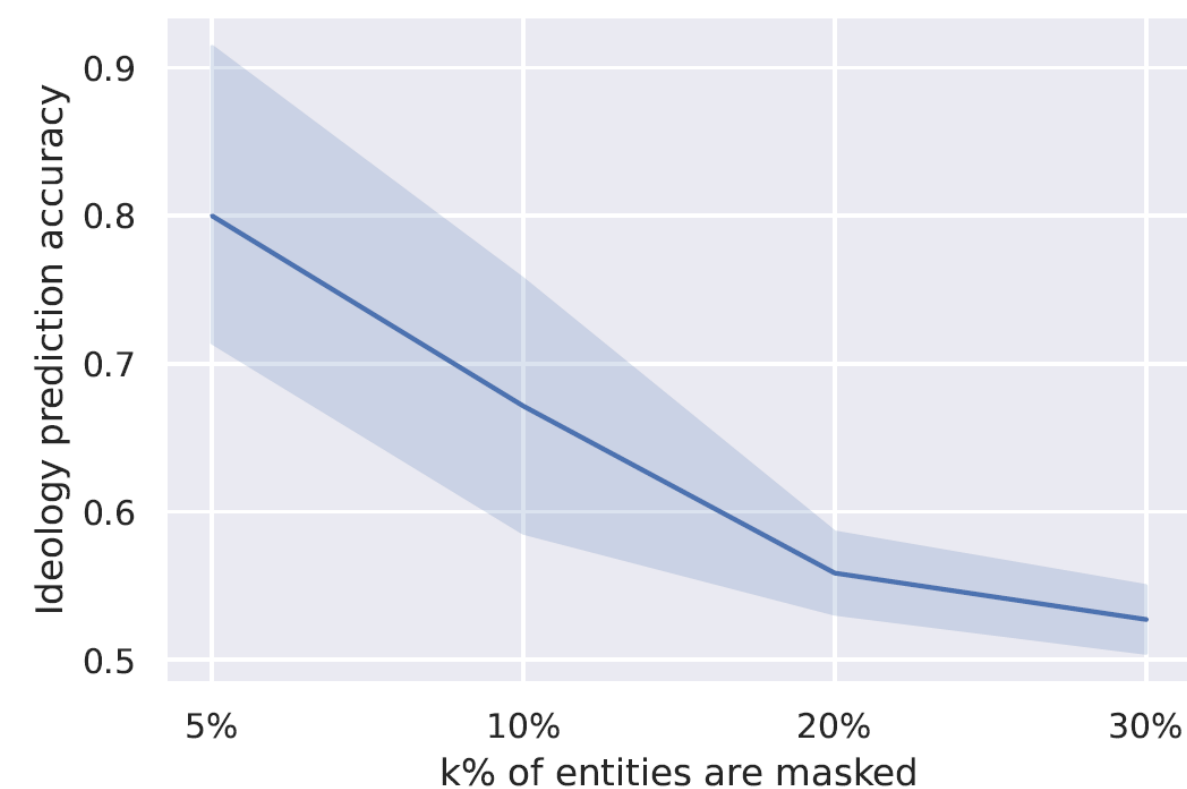
## Results & Analysis



Results on SEESAW for E2E stance detection task.



Percentage of stance triplets that media favor or criticize entities from the same or opposite side.



Entity-level ideology prediction using stances from/to their neighboring ideology-known entities.

- Big improvements by providing entities in canonical forms.
- Pipeline variant of our model provides better explainability.
- Our model enhanced with Wiki knowledge performs the best.

### Symmetrical asymmetry:

- Left is balanced while the right is unbalanced in terms of indicated positivity.
- The other way around for indicated negativity.

- Knowing entity's support/oppose interactions with other entities helps predict its own ideology.
- The more we know about an entity's sentiment interactions, the more accurate the prediction is.

Code: [github.com/launchnlp/SEESAW](https://github.com/launchnlp/SEESAW)

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